

# Elite Valve

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Customized  
valve solutions  
for the toughest  
applications



## Industrial Ball Valves

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Carbon Steel | Stainless Steel

Offering both standard and custom-engineered solutions, Elite Valve can meet all your process requirements.





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# Industrial Ball Valve Index

## B Series Stainless Steel



B01



B02



B03



B04(S)



B05



B05TC



B05TO



B07L/T

## B Series Carbon Steel



B06



B02



BT3/6

## Code Index

02 | B01

1

2

### 1 Size

02 - 1/4"; 03 - 3/8"; 05 - 1/2"; 07 - 3/4";  
10 - 1"; 12 - 1 1/4"; 15 - 1 1/2"; 20 - 2";  
25 - 2 1/2"; 30 - 3"; 40 - 4"

### 2 Valve Series

**B01** - 2 Piece, 1000 PSI, 316SS

**B02** - 2 PC, 2000/1500 WOG, 316SS

**B03** - 2 PC, 1000 WOG, 316SS,  
Direct Mount

**B04** - 3 PC, 1000 WOG, 316SS,  
Screwed Ends

**B04S** - 3 PC, 1000 WOG, 316SS,  
Socket Weld Ends

**B05** - 3 PC, 1000 WOG, 316SS,  
Direct Mount, Screwed Ends

**B05S** - 3 PC, 1000 WOG, 316SS,  
Direct Mount, Socket Weld Ends

**B05TC** - 3 PC, 1000 WOG, 316SS,  
Direct Mount, Tri-Clamps Ends

**B05TO** - 3 PC, 1000 WOG, 316SS,  
Direct Mount, Tube Ends

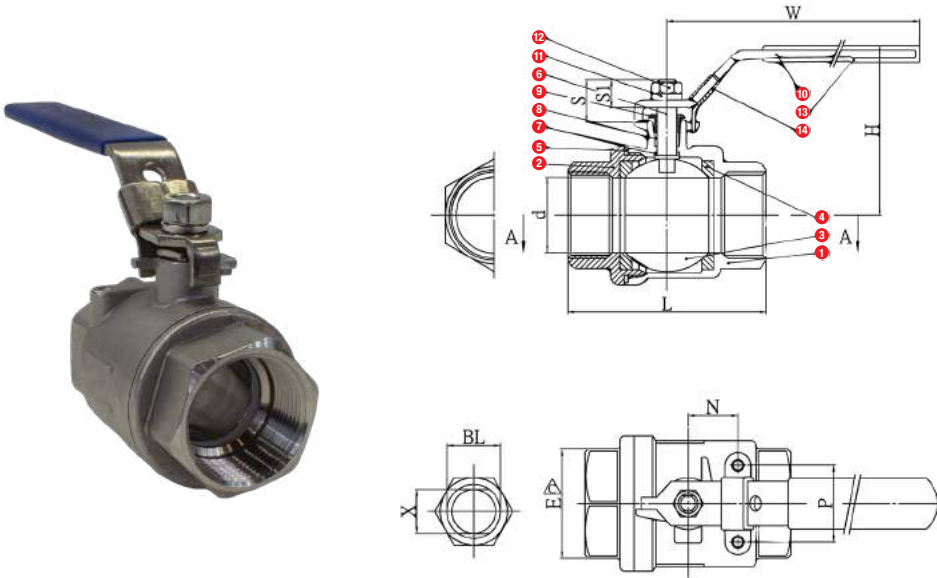
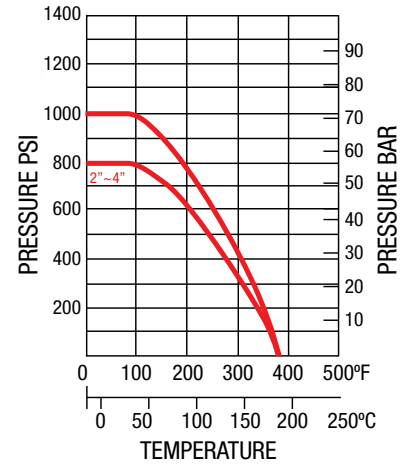
**B07L** - 3 PC, 1000 WOG, 316SS,  
3-way, L-Port

**B07T** - 3 PC, 1000 WOG, 316SS,  
3-way, T-Port

**B11** - 2 PC, 2000/1500 WOG,  
Carbon Steel

**BT3** - 3 PC, 3000 PSI, Carbon Steel

**BT6** - 3 PC, 6000 PSI, Carbon Steel

**Pressure To Temperature Rating**  
(1/4"–4")**Description**

Suitable for a full range of water, gas, steam, petrochemical and general use/utility services and applications.

**Working Pressure**

- 1000 WOG

**End Connection**

- Threaded (NPT)

**Standard**

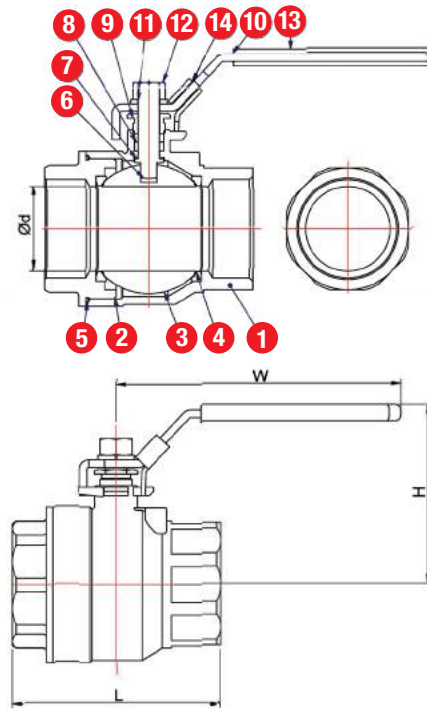
- ASTM A351-CF8M
- NACE MR0175

| Dimensions |                    |                     |                    |                    |                    |                    |                   |                    |                    |     |                  |      |               |
|------------|--------------------|---------------------|--------------------|--------------------|--------------------|--------------------|-------------------|--------------------|--------------------|-----|------------------|------|---------------|
| SIZE       | d                  | L                   | H                  | W                  | S                  | S1                 | X                 | N                  | P                  | BL  | E                | CV   | TORQUE        |
| NPS        |                    |                     |                    |                    |                    |                    |                   |                    |                    |     |                  |      | kgf-cm in-lbs |
| 1/4"       | 11.6 mm<br>0.46 in | 50 mm<br>1.97 in    | 49 mm<br>1.93 in   | 98 mm<br>3.86 in   | 15.5 mm<br>0.61 in | 9.5 mm<br>0.37 in  | 5 mm<br>0.2 in    | 12.5 mm<br>0.49 in | 28.5 mm<br>1.12 in | M8  | 17 mm<br>0.67 in | 6.6  | 50 44         |
| 3/8"       | 12.5 mm<br>0.49 in | 50 mm<br>1.97 in    | 49 mm<br>1.93 in   | 98 mm<br>3.86 in   | 15.5 mm<br>0.61 in | 9.5 mm<br>0.37 in  | 5 mm<br>0.2 in    | 12.5 mm<br>0.49 in | 28.5 mm<br>1.12 in | M8  | 21 mm<br>0.83 in | 7.9  | 50 44         |
| 1/2"       | 15 mm<br>0.59 in   | 60 mm<br>2.36 in    | 53 mm<br>2.09 in   | 98 mm<br>3.86 in   | 15.5 mm<br>0.61 in | 11 mm<br>0.43 in   | 5 mm<br>0.2 in    | 12.5 mm<br>0.49 in | 28.5 mm<br>1.12 in | M8  | 25 mm<br>0.98 in | 11.2 | 60 52         |
| 3/4"       | 20 mm<br>0.79 in   | 65 mm<br>2.56 in    | 63 mm<br>2.48 in   | 120 mm<br>4.72 in  | 17.6 mm<br>0.69 in | 12 mm<br>0.47 in   | 5.8 mm<br>0.23 in | 21 mm<br>0.83 in   | 34.5 mm<br>1.36 in | M8  | 31 mm<br>1.22 in | 21   | 95 83         |
| 1"         | 25 mm<br>0.98 in   | 80 mm<br>3.15 in    | 72 mm<br>2.83 in   | 154 mm<br>6.06 in  | 21 mm<br>0.83 in   | 14.5 mm<br>0.57 in | 7 mm<br>0.28 in   | 22.5 mm<br>0.89 in | 34.8 mm<br>1.37 in | M10 | 38 mm<br>1.5 in  | 35   | 120 104       |
| 1-1/4"     | 32 mm<br>1.26 in   | 92 mm<br>3.62 in    | 77.5 mm<br>3.05 in | 145 mm<br>5.71 in  | 21 mm<br>0.83 in   | 14.5 mm<br>0.57 in | 7 mm<br>0.28 in   | 23.5 mm<br>0.93 in | 38.1 mm<br>1.5 in  | M10 | 47 mm<br>1.85 in | 57   | 170 148       |
| 1-1/2"     | 38 mm<br>1.5 in    | 105 mm<br>4.13 in   | 92 mm<br>3.62 in   | 184 mm<br>7.24 in  | 25.5 mm<br>1 in    | 18.5 mm<br>0.73 in | 8 mm<br>0.31 in   | 23.5 mm<br>0.93 in | 38.1 mm<br>1.5 in  | M12 | 53 mm<br>2.09 in | 80   | 300 261       |
| 2"         | 50 mm<br>1.97 in   | 125 mm<br>4.92 in   | 101 mm<br>3.98 in  | 184 mm<br>7.24 in  | 25.5 mm<br>1 in    | 18.5 mm<br>0.73 in | 8 mm<br>0.31 in   | 23.5 mm<br>0.93 in | 38.1 mm<br>1.5 in  | M12 | 65 mm<br>2.56 in | 150  | 420 365       |
| 2-1/2"     | 65 mm<br>2.56 in   | 155.6 mm<br>6.13 in | 129 mm<br>5.08 in  | 245 mm<br>9.65 in  | 37 mm<br>1.46 in   | 25.5 mm<br>1 in    | 12 mm<br>0.47 in  | 32 mm<br>1.26 in   | 56 mm<br>2.2 in    | M16 | 83 mm<br>3.27 in | 265  | 480 418       |
| 3"         | 76 mm<br>2.99 in   | 183 mm<br>7.2 in    | 139 mm<br>5.47 in  | 245 mm<br>9.65 in  | 37 mm<br>1.46 in   | 25.5 mm<br>1 in    | 12 mm<br>0.47 in  | 35 mm<br>1.38 in   | 56 mm<br>2.2 in    | M16 | 98 mm<br>3.86 in | 415  | 720 626       |
| 4"         | 96 mm<br>3.78 in   | 240 mm<br>9.45 in   | 174 mm<br>6.85 in  | 318 mm<br>12.52 in | 42.5 mm<br>1.67 in | 30 mm<br>1.18 in   | 14 mm<br>0.55 in  | 50 mm<br>1.97 in   | 63 mm<br>2.48 in   | M24 | 127 mm<br>5 in   | 780  | 1080 940      |

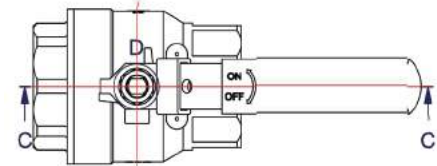
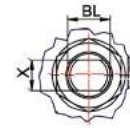
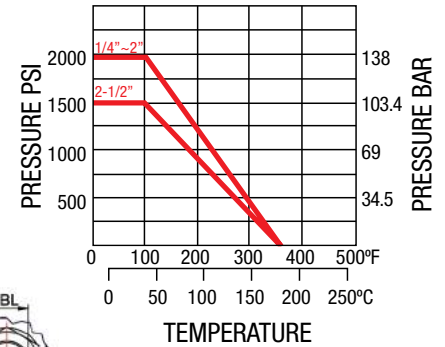
| Material Specification |                  |                 |                |
|------------------------|------------------|-----------------|----------------|
| #                      | Part             | Material        | Standard       |
| 1                      | Body             | Stainless Steel | ASTM-CF8M-A351 |
| 2                      | Ends             | Stainless Steel | ASTM-CF8M-A351 |
| 3                      | Ball             | Stainless Steel | ASTM-CF8M-A351 |
| 4                      | Ball Seat (2)    | 15% R-PTFE      | -              |
| 5                      | Joint Gasket     | PTFE            | -              |
| 6                      | Stem             | Stainless Steel | AISI 316       |
| 7                      | Thrust Washer    | PTFE            | -              |
| 8                      | Stem Packing (2) | PTFE            | -              |
| 9                      | Gland Nut        | Stainless Steel | AISI 304       |
| 10                     | Handle           | Stainless Steel | AISI 304       |
| 11                     | Spring Washer    | Stainless Steel | AISI 304       |
| 12                     | Stem Nut         | Stainless Steel | AISI 304       |
| 13                     | Handle Sleeve    | Vinyl Grip      | -              |
| 14                     | Lock Device      | Stainless Steel | AISI 430       |

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# B02



**Pressure To Temperature Rating**  
(1/4"–2-1/2")



## Description

Suitable for a full range of water, gas, steam, petrochemical and general use/utility services and applications.

## Working Pressure

- 2000 WOG

## End Connection

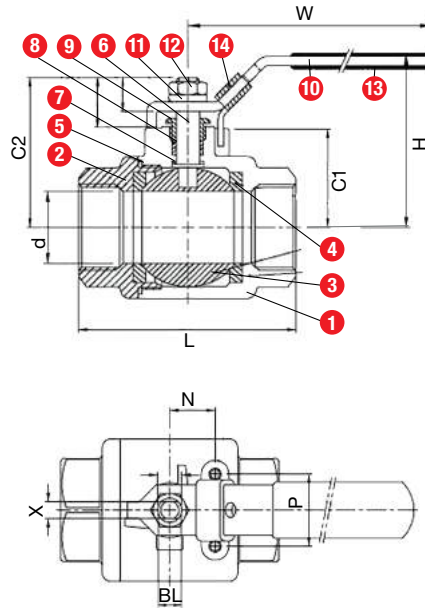
- Threaded (NPT)

## Standard

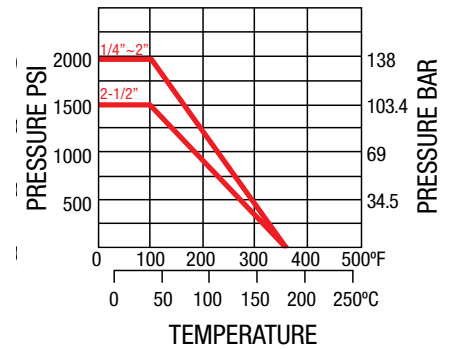
- ASTM A351-CF8M
- NACE MR0175

| Dimensions |                    |                    |                   |                   |                   |                      |      |        |        |
|------------|--------------------|--------------------|-------------------|-------------------|-------------------|----------------------|------|--------|--------|
| Size       | d                  | L                  | H                 | W                 | X                 | BL                   | CV   | TORQUE |        |
| NPS        |                    |                    |                   |                   |                   |                      |      | kgf-cm | in-lbs |
| 1/4"       | 11.6 mm<br>0.46 in | 46.5 mm<br>1.83 in | 54 mm<br>2.13 in  | 95 mm<br>3.74 in  | 5 mm<br>0.2 in    | 7.9 mm<br>0.3125 in  | 6.6  | 50     | 44     |
| 3/8"       | 12.8 mm<br>0.5 in  | 46.5 mm<br>1.83 in | 54 mm<br>2.13 in  | 95 mm<br>3.74 in  | 5 mm<br>0.2 in    | 7.9 mm<br>0.3125 in  | 7.9  | 50     | 44     |
| 1/2"       | 15 mm<br>0.59 in   | 57 mm<br>2.24 in   | 55 mm<br>2.17 in  | 95 mm<br>3.74 in  | 5 mm<br>0.2 in    | 7.9 mm<br>0.3125 in  | 11.2 | 60     | 52     |
| 3/4"       | 20 mm<br>0.79 in   | 65 mm<br>2.56 in   | 63 mm<br>2.48 in  | 110 mm<br>4.33 in | 6.5 mm<br>0.26 in | 9.5 mm<br>0.375 in   | 21   | 95     | 83     |
| 1"         | 25 mm<br>0.98 in   | 76 mm<br>2.99 in   | 77 mm<br>3.03 in  | 135 mm<br>5.31 in | 8 mm<br>0.31 in   | 11.1 mm<br>0.4375 in | 35   | 120    | 104    |
| 1-1/4"     | 32 mm<br>1.26 in   | 87.5 mm<br>3.44 in | 82 mm<br>3.23 in  | 135 mm<br>5.31 in | 8 mm<br>0.31 in   | 11.1 mm<br>0.4375 in | 57   | 170    | 148    |
| 1-1/2"     | 38 mm<br>1.5 in    | 100 mm<br>3.94 in  | 98 mm<br>3.86 in  | 165 mm<br>6.5 in  | 9 mm<br>0.35 in   | 12.7 mm<br>0.5 in    | 80   | 300    | 261    |
| 2"         | 50 mm<br>1.97 in   | 123 mm<br>4.84 in  | 108 mm<br>4.25 in | 165 mm<br>6.5 in  | 9 mm<br>0.35 in   | 12.7 mm<br>0.5 in    | 150  | 420    | 365    |
| 2-1/2"     | 65 mm<br>2.56 in   | 156 mm<br>6.14 in  | 141 mm<br>5.55 in | 215 mm<br>8.46 in | 12 mm<br>0.47 in  | 19.1 mm<br>0.75 in   | 265  | 480    | 418    |

| Material Specification |                  |                 |                |
|------------------------|------------------|-----------------|----------------|
| #                      | Part             | Material        | Standard       |
| 1                      | Body             | Stainless Steel | ASTM-CF8M-A351 |
| 2                      | Ends             | Stainless Steel | ASTM-CF8M-A351 |
| 3                      | Ball             | Stainless Steel | ASTM-CF8M-A351 |
| 4                      | Ball Seat (2)    | 15% R-PTFE      | -              |
| 5                      | Joint Gasket     | PTFE            | -              |
| 6                      | Stem             | Stainless Steel | AISI 316       |
| 7                      | Thrust Washer    | PTFE            | -              |
| 8                      | Stem Packing (2) | PTFE            | -              |
| 9                      | Gland Nut        | Stainless Steel | AISI 304       |
| 10                     | Handle           | Stainless Steel | AISI 304       |
| 11                     | Spring Washer    | Stainless Steel | AISI 304       |
| 12                     | Stem Nut         | Stainless Steel | AISI 304       |
| 13                     | Handle Sleeve    | Vinyl Grip      | -              |
| 14                     | Lock Device      | Stainless Steel | AISI 404       |



**Pressure To Temperature Rating**  
(1/4"–2-1/2")



## Description

Suitable for a full range of water, gas, steam, petrochemical and general use/utility services and applications.

## Working Pressure

- 1/4"–2": 2000 WOG
- 3": 1500 WOG

## End Connection

- Threaded (NPT)

## Standard

- ASTM A216-WCB
- NACE MR0175

| Dimensions |                    |                    |                   |                   |                   |                      |      |        |        |
|------------|--------------------|--------------------|-------------------|-------------------|-------------------|----------------------|------|--------|--------|
| Size       | d                  | L                  | H                 | W                 | X                 | BL                   | CV   | TORQUE |        |
| NPS        |                    |                    |                   |                   |                   |                      |      | kgf-cm | in-lbs |
| 1/4"       | 11.6 mm<br>0.46 in | 46.5 mm<br>1.83 in | 54 mm<br>2.13 in  | 95 mm<br>3.74 in  | 5 mm<br>0.2 in    | 7.9 mm<br>0.3125 in  | 6.6  | 50     | 44     |
| 3/8"       | 12.8 mm<br>0.5 in  | 46.5 mm<br>1.83 in | 54 mm<br>2.13 in  | 95 mm<br>3.74 in  | 5 mm<br>0.2 in    | 7.9 mm<br>0.3125 in  | 7.9  | 50     | 44     |
| 1/2"       | 15 mm<br>0.59 in   | 57 mm<br>2.24 in   | 55 mm<br>2.17 in  | 95 mm<br>3.74 in  | 5 mm<br>0.2 in    | 7.9 mm<br>0.3125 in  | 11.2 | 60     | 52     |
| 3/4"       | 20 mm<br>0.79 in   | 65 mm<br>2.56 in   | 63 mm<br>2.48 in  | 110 mm<br>4.33 in | 6.5 mm<br>0.26 in | 9.5 mm<br>0.375 in   | 21   | 95     | 83     |
| 1"         | 25 mm<br>0.98 in   | 76 mm<br>2.99 in   | 77 mm<br>3.03 in  | 135 mm<br>5.31 in | 8 mm<br>0.31 in   | 11.1 mm<br>0.4375 in | 35   | 120    | 104    |
| 1-1/4"     | 32 mm<br>1.26 in   | 87.5 mm<br>3.44 in | 82 mm<br>3.23 in  | 135 mm<br>5.31 in | 8 mm<br>0.31 in   | 11.1 mm<br>0.4375 in | 57   | 170    | 148    |
| 1-1/2"     | 38 mm<br>1.5 in    | 100 mm<br>3.94 in  | 98 mm<br>3.86 in  | 165 mm<br>6.5 in  | 9 mm<br>0.35 in   | 12.7 mm<br>0.5 in    | 80   | 300    | 261    |
| 2"         | 50 mm<br>1.97 in   | 123 mm<br>4.84 in  | 108 mm<br>4.25 in | 165 mm<br>6.5 in  | 9 mm<br>0.35 in   | 12.7 mm<br>0.5 in    | 150  | 420    | 365    |
| 2-1/2"     | 65 mm<br>2.56 in   | 156 mm<br>6.14 in  | 141 mm<br>5.55 in | 215 mm<br>8.46 in | 12 mm<br>0.47 in  | 19.1 mm<br>0.75 in   | 265  | 480    | 418    |

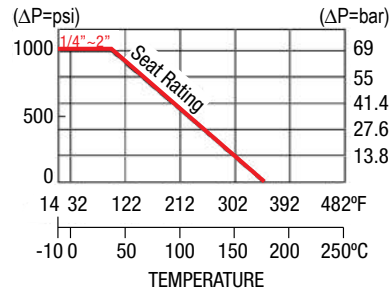
| Material Specification |               |                 |                |
|------------------------|---------------|-----------------|----------------|
| #                      | Part          | Material        | Standard       |
| 1                      | Body          | Carbon Steel    | ASTM-A216-WCB  |
| 2                      | Ends          | Carbon Steel    | ASTM-A216-WCB  |
| 3                      | Ball          | Stainless Steel | ASTM-CF8M-A351 |
| 4                      | Ball Seat     | 15% R-PTFE      | -              |
| 5                      | Joint Gasket  | PTFE            | -              |
| 6                      | Stem          | Stainless Steel | AISI 316       |
| 7                      | Thrust Washer | PTFE            | -              |
| 8                      | Stem Packing  | PTFE            | -              |
| 9                      | Gland Nut     | Stainless Steel | AISI 304       |
| 10                     | Handle        | Stainless Steel | AISI 304       |
| 11                     | Spring Washer | Stainless Steel | AISI 304       |
| 12                     | Stem Nut      | Stainless Steel | AISI 304       |
| 13                     | Handle Sleeve | Vinyl           | -              |
| 14                     | Lock Device   | Stainless Steel | AISI 304       |

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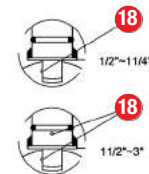
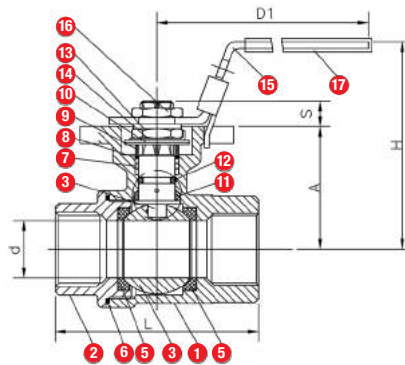
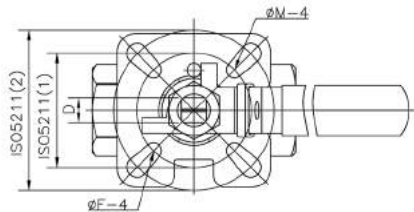
# B03



## Pressure To Temperature Rating (1/4"–4")



| Material Specification |                   |                  |                    |
|------------------------|-------------------|------------------|--------------------|
| #                      | Part              | Material         | Standard           |
| 1                      | Body              | Stainless Steel  | ASTM-A351 Gr. CF8M |
| 2                      | Ends              | Stainless Steel  | ASTM-A351 Gr. CF8M |
| 3                      | Ball              | Stainless Steel  | ASTM-A351 Gr. CF8M |
| 4                      | Stem              | Stainless Steel  | 316SS              |
| 5                      | Ball Seat         | 15% RTFE         | -                  |
| 6                      | Gasket            | 15% RTFE         | -                  |
| 7                      | Stem Packing      | 15% RTFE         | -                  |
| 8                      | Thrust Washer     | 15% RTFE         | -                  |
| 9                      | Stem Packing      | Stainless Steel  | 304SS              |
| 10                     | Belleville Washer | Stainless Steel  | SUS 304-USP        |
| 11                     | Thrust Washer     | PTFE +25% Carbon | -                  |
| 12                     | O-Ring            | Viton            | -                  |
| 13                     | Locking Washer    | Stainless Steel  | 304SS              |
| 14                     | Stem Nut          | Stainless Steel  | 304SS              |
| 15                     | Handle            | Stainless Steel  | 304SS              |
| 16                     | Handle Nut        | Stainless Steel  | 304SS              |
| 17                     | Handle Cover      | Vinyl Grip       | -                  |



## Description

Suitable for a full range of water, gas, steam, petrochemical and general use/utility services and applications.

## Working Pressure

- 1000 WOG

## End Connection

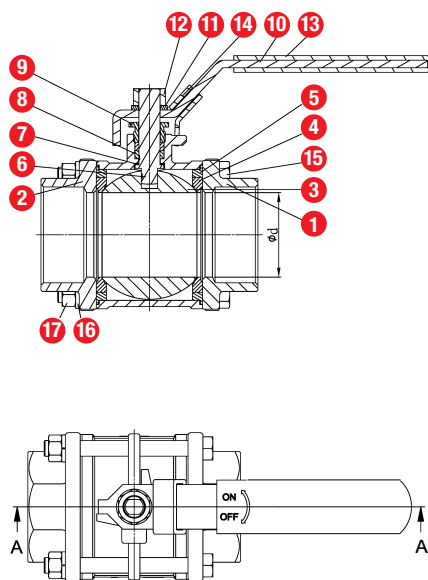
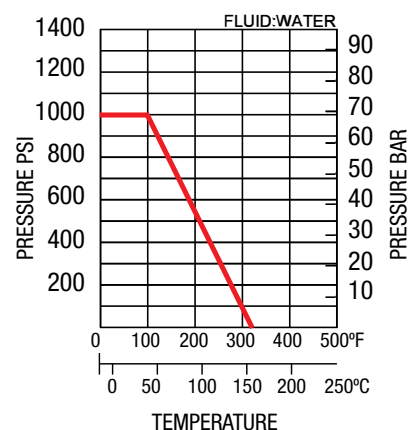
- Threaded (NPT)

## Standard

- ASTM A351-CF8M
- NACE MR0175
- Direct mounting pad for ISO Std 5211

| Dimensions |                  |                     |                     |                   |                  |                  |                    |          |     |                   |                   |      |        |        |
|------------|------------------|---------------------|---------------------|-------------------|------------------|------------------|--------------------|----------|-----|-------------------|-------------------|------|--------|--------|
| SIZE       | d                | L                   | H                   | D1                | D                | S                | A                  | ISO 5211 |     | ØF                | ØM                | CV   | TORQUE |        |
| NPS        |                  |                     |                     |                   |                  |                  |                    |          |     |                   |                   |      | kgf-cm | in-lbs |
| 1/2"       | 15 mm<br>0.59 in | 65.3 mm<br>2.57 in  | 72.9 mm<br>2.87 in  | 112 mm<br>4.41 in | 9 mm<br>0.35 in  | 8.5mm<br>0.33in  | 37 mm<br>1.46 in   | F04      | F05 | 6 mm<br>0.24 in   | 7.5 mm<br>0.3 in  | 11.2 | 36     | 31     |
| 3/4"       | 20 mm<br>0.79 in | 77.3 mm<br>3.04 in  | 81.8 mm<br>3.22 in  | 112 mm<br>4.41 in | 9 mm<br>0.35 in  | 8.5mm<br>0.33in  | 45 mm<br>1.77 in   | F05      | F07 | 7.5 mm<br>0.3 in  | 9.5 mm<br>0.37 in | 21   | 92     | 80     |
| 1"         | 25 mm<br>0.98 in | 88.7 mm<br>3.49 in  | 90.5 mm<br>3.56 in  | 136 mm<br>5.35 in | 11 mm<br>0.43 in | 11.4mm<br>0.45in | 53.5 mm<br>2.11 in | F05      | F07 | 7.5 mm<br>0.3 in  | 9.5 mm<br>0.37 in | 35   | 168    | 146    |
| 1-1/2"     | 38 mm<br>1.5 in  | 109 mm<br>4.29 in   | 114.7 mm<br>4.52 in | 198 mm<br>7.8 in  | 14 mm<br>0.55 in | 14mm<br>0.55in   | 74.8 mm<br>2.94 in | F05      | F07 | 7.5 mm<br>0.3 in  | 9.5 mm<br>0.37 in | 80   | 230    | 200    |
| 2"         | 50 mm<br>1.97 in | 125.3 mm<br>4.93 in | 124 mm<br>4.88 in   | 198 mm<br>7.8 in  | 14 mm<br>0.55 in | 13.7mm<br>0.54in | 83.5 mm<br>3.29 in | F07      | F10 | 9.5 mm<br>0.37 in | 11 mm<br>0.43 in  | 150  | 367    | 319    |

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**B04(S)****Pressure To Temperature Rating**  
(1/4"–4")**Description**

Suitable for a full range of water, gas, steam, petrochemical and general use/utility services and applications.

**Working Pressure**

- 1000 WOG

**End Connection**

- Threaded (NPT)
- Socket Weld

**Standard**

- ASTM A351-CF8M
- NACE MR0175

**Dimensions**

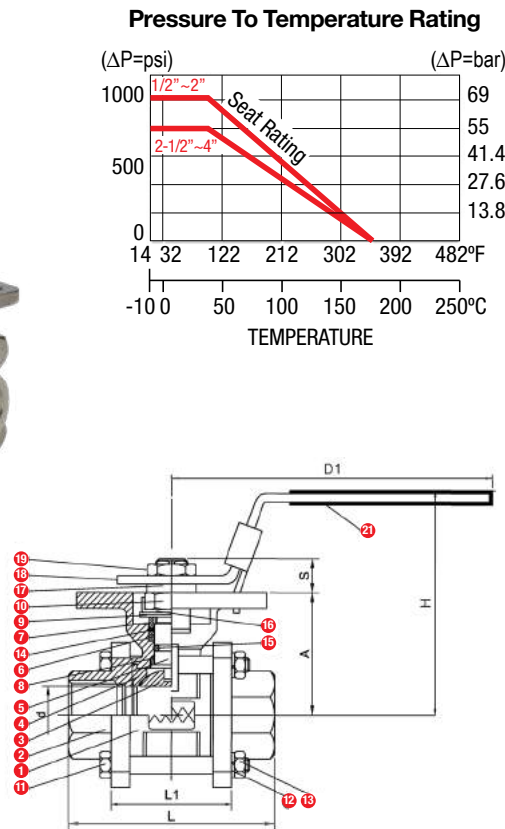
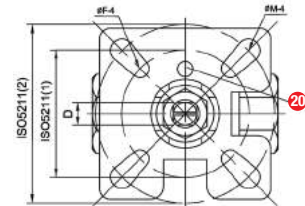
| Size<br>NPS | d                  | L                   | H                 | W                  | ØB                 | ØE                 | ØS                  | TORQUE |        |
|-------------|--------------------|---------------------|-------------------|--------------------|--------------------|--------------------|---------------------|--------|--------|
|             |                    |                     |                   |                    |                    |                    |                     | kgf-cm | in-lbs |
| 1/4"        | 11.6 mm<br>0.46 in | 54 mm<br>2.13 in    | 55 mm<br>2.17 in  | 93 mm<br>3.66 in   | 12 mm<br>0.47 in   | 18 mm<br>0.71 in   | 14.1 mm<br>0.56 in  | 40     | 35     |
| 3/8"        | 12.8 mm<br>0.5 in  | 54 mm<br>2.13 in    | 55 mm<br>2.17 in  | 93 mm<br>3.66 in   | 14 mm<br>0.55 in   | 18 mm<br>0.71 in   | 17.6 mm<br>0.69 in  | 40     | 35     |
| 1/2"        | 15 mm<br>0.59 in   | 61.8 mm<br>2.43 in  | 56 mm<br>2.2 in   | 93 mm<br>3.66 in   | 15.8 mm<br>0.62 in | 22 mm<br>0.87 in   | 21.7 mm<br>0.85 in  | 54     | 47     |
| 3/4"        | 20 mm<br>0.79 in   | 71 mm<br>2.8 in     | 63 mm<br>2.48 in  | 113 mm<br>4.45 in  | 21 mm<br>0.83 in   | 28 mm<br>1.1 in    | 27.2 mm<br>1.07 in  | 74     | 64     |
| 1"          | 25 mm<br>0.98 in   | 83.8 mm<br>3.3 in   | 77 mm<br>3.03 in  | 138 mm<br>5.43 in  | 26.7 mm<br>1.05 in | 34 mm<br>1.34 in   | 33.9 mm<br>1.33 in  | 104    | 90     |
| 1-1/4"      | 32 mm<br>1.26 in   | 97.2 mm<br>3.83 in  | 82 mm<br>3.23 in  | 138 mm<br>5.43 in  | 35 mm<br>1.38 in   | 44 mm<br>1.73 in   | 42.6 mm<br>1.68 in  | 135    | 117    |
| 1-1/2"      | 38 mm<br>1.5 in    | 110.8 mm<br>4.36 in | 92 mm<br>3.62 in  | 163 mm<br>6.42 in  | 41 mm<br>1.61 in   | 50 mm<br>1.97 in   | 48.7 mm<br>1.92 in  | 180    | 157    |
| 2"          | 50 mm<br>1.97 in   | 128.6 mm<br>5.06 in | 107 mm<br>4.21 in | 163 mm<br>6.42 in  | 52.5 mm<br>2.07 in | 61.5 mm<br>2.42 in | 61.1 mm<br>2.41 in  | 250    | 218    |
| 2-1/2"      | 65 mm<br>2.56 in   | 171.4 mm<br>6.75 in | 142 mm<br>5.59 in | 218 mm<br>8.58 in  | 69 mm<br>2.72 in   | 76 mm<br>2.99 in   | 76.9 mm<br>3.03 in  | 480    | 418    |
| 3"          | 80 mm<br>3.15 in   | 197 mm<br>7.76 in   | 152 mm<br>5.98 in | 218 mm<br>8.58 in  | 82 mm<br>3.23 in   | 90 mm<br>3.54 in   | 89.8 mm<br>3.54 in  | 750    | 653    |
| 4"          | 100 mm<br>3.94 in  | 252 mm<br>9.92 in   | 175 mm<br>6.89 in | 326 mm<br>12.83 in | 106 mm<br>4.17 in  | 115 mm<br>4.53 in  | 115.4 mm<br>4.54 in | 1100   | 957    |

**Material Specification**

| #  | Part                 | Material        | Standard       |
|----|----------------------|-----------------|----------------|
| 1  | Body                 | Stainless Steel | ASTM-CF8M-A351 |
| 2  | Ends                 | Stainless Steel | ASTM-CF8M-A351 |
| 3  | Ball                 | Stainless Steel | ASTM-CF8M-A351 |
| 4  | Ball Seat (2)        | 15% RTFE        |                |
| 5  | Joint Gasket         | 15% RTFE        |                |
| 6  | Stem                 | Stainless Steel | AISI 316       |
| 7  | Thrust Washer        | PTFE            | -              |
| 8  | Stem Packing (2)     | PTFE            | -              |
| 9  | Gland Nut            | Stainless Steel | AISI 304       |
| 10 | Handle               | Stainless Steel | AISI 304       |
| 11 | Stem Washer          | Stainless Steel | AISI 304       |
| 12 | Stem Nut             | Stainless Steel | AISI 304       |
| 13 | Handle Sleeve        | Vinyl Grip      | -              |
| 14 | Lock Device          | Stainless Steel | AISI 304       |
| 15 | Bolt (4-6)           | Stainless Steel | AISI 304       |
| 16 | Spring Washer (4-12) | Stainless Steel | AISI 304       |
| 17 | Hex Nut (4-12)       | Stainless Steel | AISI 304       |

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# B05(S)



| Material Specification |                   |                  |                                    |
|------------------------|-------------------|------------------|------------------------------------|
| #                      | Part              | Material         | Standard                           |
| 1                      | Body              | Stainless Steel  | ASTM-A351 Gr. CF8M                 |
| 2                      | Ends (2)          | Stainless Steel  | ASTM-A351 Gr. CF8M<br>*CF3M for SW |
| 3                      | Ball              | Stainless Steel  | ASTM-A351 Gr. CF8M                 |
| 4                      | Stem              | Stainless Steel  | 316SS                              |
| 5                      | Seat (2)          | 15% RTFE         | -                                  |
| 6                      | Stem Packing      | 25% CTFE         | -                                  |
| 7                      | Washer            | Stainless Steel  | 304SS                              |
| 8                      | Thrust Washer     | PTFE +25% Carbon | -                                  |
| 9                      | Belleville Washer | Stainless Steel  | SUS 304-CSP                        |
| 10                     | Stem Nut          | Stainless Steel  | 304SS                              |
| 11                     | Bolts             | Stainless Steel  | 304SS                              |
| 12                     | Spring Washer     | Stainless Steel  | 304SS                              |
| 13                     | Bolt Nuts         | Stainless Steel  | 304SS                              |
| 14                     | Stem Ring         | PTFE +25% Carbon | -                                  |
| 15                     | O-Ring            | Viton            | -                                  |
| 16                     | Stopper Washer    | Stainless Steel  | 304SS                              |
| 17                     | Square            | Stainless Steel  | 304SS                              |
| 18                     | Handle            | Stainless Steel  | 304SS                              |
| 19                     | Handle Nut        | Stainless Steel  | 304SS                              |
| 20                     | Stopper Pin       | Stainless Steel  | 304SS                              |
| 21                     | Handle Sleeve     | Vinyl            | -                                  |

## Description

Suitable for a full range of water, gas, steam, petrochemical and general use/utility services and applications.

## Working Pressure

- 1/2"-2": 1000 WOG
- 2 1/2"-4": 800 WOG

## End Connection

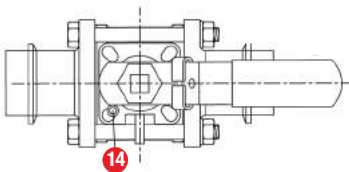
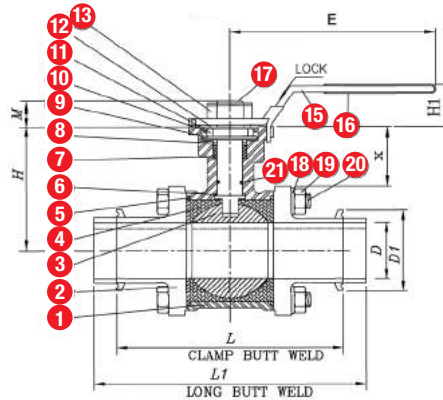
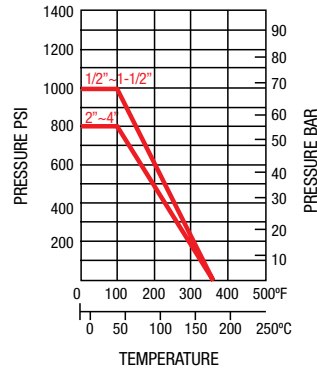
- Threaded (NPT)
- Socket Weld

## Standard

- ASTM A351-CF8M
- Direct mounting pad for ISO Std 5211

| Dimensions |                   |                     |                     |                     |                   |                   |                    |                  |                    |                     |          |     |                   |                    |      |        |        |
|------------|-------------------|---------------------|---------------------|---------------------|-------------------|-------------------|--------------------|------------------|--------------------|---------------------|----------|-----|-------------------|--------------------|------|--------|--------|
| SIZE       | d                 | L                   | L1                  | L2                  | L3                | H                 | D1                 | D                | S                  | A                   | ISO 5211 |     | ØF                | ØM                 | CV   | TORQUE |        |
| NPS        |                   |                     |                     |                     |                   |                   |                    |                  |                    |                     |          |     |                   |                    |      | kgf-cm | in-lbs |
| 1/2"       | 15 mm<br>0.59 in  | 63.5 mm<br>2.5 in   | 22.5 mm<br>0.89 in  | 85.9 mm<br>3.38 in  | 10 mm<br>0.39 in  | 73 mm<br>2.87 in  | 112 mm<br>4.41 in  | 9 mm<br>0.35 in  | 8.5 mm<br>0.33 in  | 37 mm<br>1.46 in    | F04      | F05 | 6 mm<br>0.24 in   | 7.5 mm<br>0.3 in   | 54   | 61     | 53     |
| 3/4"       | 20 mm<br>0.79 in  | 72.5 mm<br>2.85 in  | 27.5 mm<br>1.08 in  | 97.5 mm<br>3.84 in  | 13 mm<br>0.51 in  | 81 mm<br>3.19 in  | 112 mm<br>4.41 in  | 9 mm<br>0.35 in  | 8.5 mm<br>0.33 in  | 45 mm<br>1.77 in    | F05      | F07 | 7.5 mm<br>0.3 in  | 9.5 mm<br>0.37 in  | 74   | 112    | 97     |
| 1"         | 25 mm<br>0.98 in  | 81 mm<br>3.19 in    | 34 mm<br>1.34 in    | 108.2 mm<br>4.26 in | 7.5 mm<br>0.3 in  | 91 mm<br>3.58 in  | 136 mm<br>5.35 in  | 11 mm<br>0.43 in | 11.4 mm<br>0.45 in | 53.5 mm<br>2.11 in  | F05      | F07 | 7.5 mm<br>0.3 in  | 9.5 mm<br>0.37 in  | 104  | 204    | 177    |
| 1-1/4"     | 32 mm<br>1.26 in  | 94.5 mm<br>3.72 in  | 42.5 mm<br>1.67 in  | 110 mm<br>4.33 in   | 7.5 mm<br>0.3 in  | 99 mm<br>3.9 in   | 185 mm<br>7.28 in  | 11 mm<br>0.43 in | 11.4 mm<br>0.45 in | 59 mm<br>2.32 in    | F05      | F07 | 7.5 mm<br>0.3 in  | 9.5 mm<br>0.37 in  | 135  | 215    | 187    |
| 1-1/2"     | 38 mm<br>1.5 in   | 108 mm<br>4.25 in   | 52 mm<br>2.05 in    | 135.8 mm<br>5.35 in | 7.5 mm<br>0.3 in  | 115 mm<br>4.53 in | 198 mm<br>7.8 in   | 14 mm<br>0.55 in | 14 mm<br>0.55 in   | 74.8 mm<br>2.94 in  | F05      | F07 | 7.5 mm<br>0.3 in  | 9.5 mm<br>0.37 in  | 180  | 367    | 319    |
| 2"         | 50 mm<br>1.97 in  | 121.5 mm<br>4.78 in | 63.5 mm<br>2.5 in   | 154.7 mm<br>6.09 in | 9.5 mm<br>0.37 in | 124 mm<br>4.88 in | 198 mm<br>7.8 in   | 14 mm<br>0.55 in | 13.7 mm<br>0.54 in | 83.5 mm<br>3.29 in  | F07      | F10 | 9.5 mm<br>0.37 in | 11 mm<br>0.43 in   | 250  | 632    | 550    |
| 2-1/2"     | 65 mm<br>2.56 in  | 157.5 mm<br>6.2 in  | 85.5 mm<br>3.37 in  | 168.5 mm<br>6.63 in | 9.5 mm<br>0.37 in | 155 mm<br>6.1 in  | 264 mm<br>10.39 in | 17 mm<br>0.67 in | 18 mm<br>0.71 in   | 108.8 mm<br>4.28 in | F07      | F10 | 9.5 mm<br>0.37 in | 11 mm<br>0.43 in   | 480  | 918    | 799    |
| 3"         | 80 mm<br>3.15 in  | 190 mm<br>7.48 in   | 102 mm<br>4.02 in   | 196.2 mm<br>7.72 in | 11 mm<br>0.43 in  | 165 mm<br>6.5 in  | 264 mm<br>10.39 in | 17 mm<br>0.67 in | 18 mm<br>0.71 in   | 118.3 mm<br>4.66 in | F10      | F12 | 11 mm<br>0.43 in  | 14.3 mm<br>0.56 in | 750  | 1795   | 1562   |
| 4"         | 100 mm<br>3.94 in | 225 mm<br>8.86 in   | 128.5 mm<br>5.06 in | 232.5 mm<br>9.15 in | 11 mm<br>0.43 in  | 217 mm<br>8.54 in | 325 mm<br>12.8 in  | 22 mm<br>0.87 in | 23 mm<br>0.91 in   | 153.8 mm<br>6.06 in | F10      | F12 | 11 mm<br>0.43 in  | 14.3 mm<br>0.56 in | 1100 | 2040   | 1775   |

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**Pressure To Temperature Rating****Material Specification**

| #  | Part              | Material         | Standard           |
|----|-------------------|------------------|--------------------|
| 1  | Body              | Stainless Steel  | ASTM-A351 Gr. CF8M |
| 2  | Ends (2)          | Stainless Steel  | ASTM-A351 Gr. CF8M |
| 3  | Ball              | Stainless Steel  | ASTM-A351 Gr. CF8M |
| 4  | Stem              | Stainless Steel  | 316SS              |
| 5  | Seat (2)          | 15% RTFE         | -                  |
| 6  | Stem Packing      | 25% CTFE         | -                  |
| 7  | Washer            | Stainless Steel  | 304SS              |
| 8  | Thrust Washer     | PTFE +25% Carbon | -                  |
| 9  | Belleville Washer | Stainless Steel  | SUS 304-CSP        |
| 10 | Stem Nut          | Stainless Steel  | 304SS              |
| 11 | Bolts             | Stainless Steel  | 304SS              |
| 12 | Spring Washer     | Stainless Steel  | 304SS              |
| 13 | Bolt Nuts         | Stainless Steel  | 304SS              |
| 14 | Stem Ring         | PTFE +25% Carbon | -                  |
| 15 | O-Ring            | Viton            | -                  |
| 16 | Stopper Washer    | Stainless Steel  | 304SS              |
| 17 | Square            | Stainless Steel  | 304SS              |
| 18 | Handle            | Stainless Steel  | 304SS              |
| 19 | Handle Nut        | Stainless Steel  | 304SS              |
| 20 | Stopper Pin       | Stainless Steel  | 304SS              |
| 21 | Handle Sleeve     | Vinyl            | -                  |

**Description**

Suitable for a full range of water, gas, steam, petrochemical and general use/utility services and applications. Cavity free. Inside surfaces polished to Ra 0.4.

**Working Pressure**

- 1000 WOG

**End Connection**

- Tri-Clamp

**Standard**

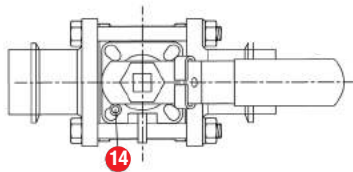
- ASTM A351-CF8M
- Direct mounting pad for ISO Std 5211

**Dimensions**

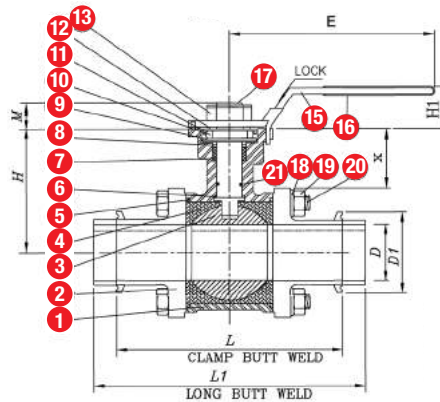
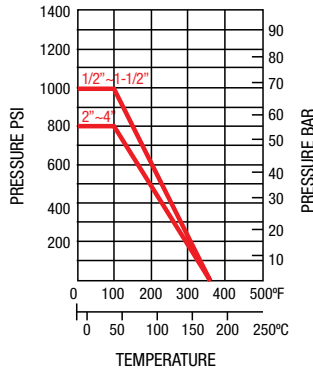
| SIZE   | D                  | L                 | L1                  | H                   | H1               | M                | X                  | K                | A                   | D1                 | E                  | ISO 5211 | C1               | C2               | CV   | TORQUE |        |
|--------|--------------------|-------------------|---------------------|---------------------|------------------|------------------|--------------------|------------------|---------------------|--------------------|--------------------|----------|------------------|------------------|------|--------|--------|
| NPS    |                    |                   |                     |                     |                  |                  |                    |                  |                     |                    |                    |          |                  |                  |      | kgf-cm | in-lbs |
| 1/2"   | 9.5 mm<br>0.37 in  | 89 mm<br>3.5 in   | 137 mm<br>5.39 in   | 37 mm<br>1.46 in    | 26 mm<br>1.02 in | 9 mm<br>0.35 in  | 15.5 mm<br>0.61 in | 9 mm<br>0.35 in  | 37 mm<br>1.46 in    | 25.4 mm<br>1 in    | 143 mm<br>5.63 in  | F03 F04  | 6 mm<br>0.24 in  | 6 mm<br>0.24 in  | 54   | 103    | 90     |
| 3/4"   | 15.9 mm<br>0.63 in | 101 mm<br>3.98 in | 147 mm<br>5.79 in   | 47 mm<br>1.85 in    | 26 mm<br>1.02 in | 9 mm<br>0.35 in  | 20.6 mm<br>0.81 in | 9 mm<br>0.35 in  | 45 mm<br>1.77 in    | 25.4 mm<br>1 in    | 143 mm<br>5.63 in  | F03 F04  | 6 mm<br>0.24 in  | 6 mm<br>0.24 in  | 74   | 115    | 100    |
| 1"     | 22.2 mm<br>0.87 in | 114 mm<br>4.49 in | 168 mm<br>6.61 in   | 57.2 mm<br>2.25 in  | 34 mm<br>1.34 in | 11 mm<br>0.43 in | 29 mm<br>1.14 in   | 11 mm<br>0.43 in | 53.5 mm<br>2.11 in  | 50.4 mm<br>1.98 in | 160 mm<br>6.3 in   | F04 F05  | 6 mm<br>0.24 in  | 8 mm<br>0.31 in  | 104  | 161    | 140    |
| 1-1/4" | 28.5 mm<br>1.12 in | 124 mm<br>4.88 in | 42.5 mm<br>1.67 in  | 62.5 mm<br>2.46 in  | 41 mm<br>1.61 in | 11 mm<br>0.43 in | 29 mm<br>1.14 in   | 11 mm<br>0.43 in | 59 mm<br>2.32 in    | 50.4 mm<br>1.98 in | 160 mm<br>6.3 in   | F04 F05  | 6 mm<br>0.24 in  | 8 mm<br>0.31 in  | 135  | 201    | 175    |
| 1-1/2" | 35 mm<br>1.38 in   | 140 mm<br>5.51 in | 186 mm<br>7.32 in   | 78.2 mm<br>3.08 in  | 43 mm<br>1.69 in | 14 mm<br>0.55 in | 39 mm<br>1.54 in   | 14 mm<br>0.55 in | 74.8 mm<br>2.94 in  | 50.4 mm<br>1.98 in | 187 mm<br>7.36 in  | F05 F07  | 8 mm<br>0.31 in  | 10 mm<br>0.39 in | 180  | 276    | 240    |
| 2"     | 47.6 mm<br>1.87 in | 156 mm<br>6.14 in | 223 mm<br>8.78 in   | 86.2 mm<br>3.39 in  | 43 mm<br>1.69 in | 14 mm<br>0.55 in | 42 mm<br>1.65 in   | 14 mm<br>0.55 in | 83.5 mm<br>3.29 in  | 63.8 mm<br>2.51 in | 187 mm<br>7.36 in  | F05 F07  | 8 mm<br>0.31 in  | 10 mm<br>0.39 in | 250  | 552    | 480    |
| 2-1/2" | 60.3 mm<br>2.37 in | 197 mm<br>7.76 in | 250.4 mm<br>9.86 in | 109.2 mm<br>4.3 in  | 53 mm<br>2.09 in | 17 mm<br>0.67 in | 48 mm<br>1.89 in   | 17 mm<br>0.67 in | 108.8 mm<br>4.28 in | 77.6 mm<br>3.06 in | 310 mm<br>12.2 in  | F07 F10  | 10 mm<br>0.39 in | 12 mm<br>0.47 in | 480  | 747    | 650    |
| 3"     | 73 mm<br>2.87 in   | 229 mm<br>9.02 in | 302 mm<br>11.89 in  | 116.2 mm<br>4.57 in | 53 mm<br>2.09 in | 17 mm<br>0.67 in | 48.7 mm<br>1.92 in | 17 mm<br>0.67 in | 118.3 mm<br>4.66 in | 91 mm<br>3.58 in   | 310 mm<br>12.2 in  | F07 F10  | 10 mm<br>0.39 in | 12 mm<br>0.47 in | 750  | 1322   | 1150   |
| 4"     | 97.4 mm<br>3.83 in | 241 mm<br>9.49 in | 317.5 mm<br>12.5 in | 133.5 mm<br>5.26 in | 56 mm<br>2.2 in  | 22 mm<br>0.87 in | 34 mm<br>1.34 in   | 22 mm<br>0.87 in | 153.8 mm<br>6.06 in | 119 mm<br>4.69 in  | 400 mm<br>15.75 in | F10 F12  | 12 mm<br>0.47 in | 14 mm<br>0.55 in | 1100 | 1609   | 1400   |

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# B05TO



## Pressure To Temperature Rating



## Material Specification

| #  | Part              | Material        | Standard          |
|----|-------------------|-----------------|-------------------|
| 1  | Body              | Stainless Steel | AISI 304/316/316L |
| 2  | Ends              | Stainless Steel | AISI 304/316/316L |
| 3  | Ball              | Stainless Steel | AISI 304/316/316L |
| 4  | Seat              | PTFE/TFM 1600   | -                 |
| 5  | Gasket            | PTFE            | -                 |
| 6  | Thrust Packing    | PTFE            | -                 |
| 7  | Stem Packing      | PTFE            | -                 |
| 8  | Ring              | Stainless Steel | AISI 304          |
| 9  | Belleville Washer | Stainless Steel | AISI 304          |
| 10 | Stem Nut          | Stainless Steel | AISI 304          |
| 11 | Lock Washer       | Stainless Steel | AISI 304          |
| 12 | Ring              | Stainless Steel | AISI 304          |
| 13 | Handle Nut        | Stainless Steel | AISI 304          |
| 14 | Stop Pin          | Stainless Steel | AISI 304          |
| 15 | Handle            | Stainless Steel | AISI 304          |
| 16 | Handle Sleeve     | Plastic         | Plastic           |
| 17 | Stem              | Stainless Steel | AISI 316          |
| 18 | Spring Washer     | Stainless Steel | AISI 304          |
| 19 | Bolt Nut          | Stainless Steel | AISI 304          |
| 20 | Bolt              | Stainless Steel | AISI 304          |
| 21 | O-Ring            | Viton           | -                 |

## Description

Suitable for a full range of water, gas, steam, petrochemical and general use/utility services and applications. Cavity free. Inside surfaces polished to Ra 0.4.

## Working Pressure

- 1000 WOG

## End Connection

- Tube ends

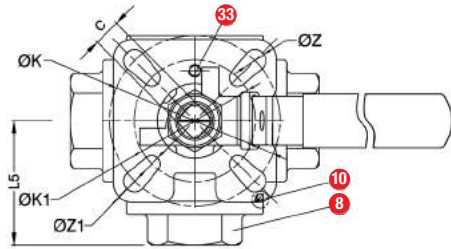
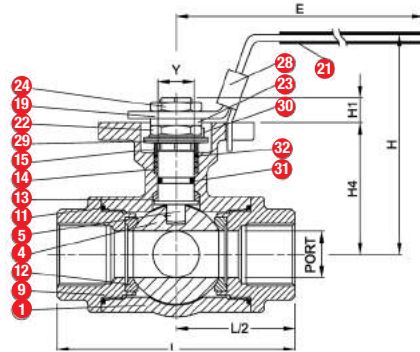
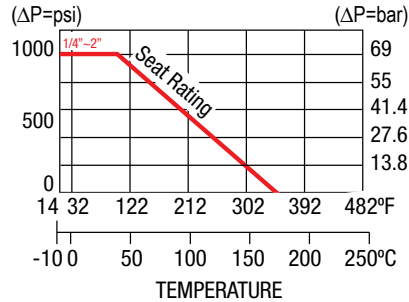
## Standard

- ASTM A351-CF8M
- Direct mounting pad for ISO Std 5211

## Dimensions

| SIZE   | D                  | L                 | L1                  | H                   | H1               | M                | X                  | K                | A                   | D1                 | E                  | ISO 5211 | C1               | C2               | CV   | TORQUE |        |
|--------|--------------------|-------------------|---------------------|---------------------|------------------|------------------|--------------------|------------------|---------------------|--------------------|--------------------|----------|------------------|------------------|------|--------|--------|
| NPS    |                    |                   |                     |                     |                  |                  |                    |                  |                     |                    |                    |          |                  |                  |      | kgf-cm | in-lbs |
| 1/2"   | 9.5 mm<br>0.37 in  | 89 mm<br>3.5 in   | 137 mm<br>5.39 in   | 37 mm<br>1.46 in    | 26 mm<br>1.02 in | 9 mm<br>0.35 in  | 15.5 mm<br>0.61 in | 9 mm<br>0.35 in  | 37 mm<br>1.46 in    | 25.4 mm<br>1 in    | 143 mm<br>5.63 in  | F03 F04  | 6 mm<br>0.24 in  | 6 mm<br>0.24 in  | 54   | 103    | 90     |
| 3/4"   | 15.9 mm<br>0.63 in | 101 mm<br>3.98 in | 147 mm<br>5.79 in   | 47 mm<br>1.85 in    | 26 mm<br>1.02 in | 9 mm<br>0.35 in  | 20.6 mm<br>0.81 in | 9 mm<br>0.35 in  | 45 mm<br>1.77 in    | 25.4 mm<br>1 in    | 143 mm<br>5.63 in  | F03 F04  | 6 mm<br>0.24 in  | 6 mm<br>0.24 in  | 74   | 115    | 100    |
| 1"     | 22.2 mm<br>0.87 in | 114 mm<br>4.49 in | 168 mm<br>6.61 in   | 57.2 mm<br>2.25 in  | 34 mm<br>1.34 in | 11 mm<br>0.43 in | 29 mm<br>1.14 in   | 11 mm<br>0.43 in | 53.5 mm<br>2.11 in  | 50.4 mm<br>1.98 in | 160 mm<br>6.3 in   | F04 F05  | 6 mm<br>0.24 in  | 8 mm<br>0.31 in  | 104  | 161    | 140    |
| 1-1/4" | 28.5 mm<br>1.12 in | 124 mm<br>4.88 in | 42.5 mm<br>1.67 in  | 62.5 mm<br>2.46 in  | 41 mm<br>1.61 in | 11 mm<br>0.43 in | 29 mm<br>1.14 in   | 11 mm<br>0.43 in | 59 mm<br>2.32 in    | 50.4 mm<br>1.98 in | 160 mm<br>6.3 in   | F04 F05  | 6 mm<br>0.24 in  | 8 mm<br>0.31 in  | 135  | 201    | 175    |
| 1-1/2" | 35 mm<br>1.38 in   | 140 mm<br>5.51 in | 186 mm<br>7.32 in   | 78.2 mm<br>3.08 in  | 43 mm<br>1.69 in | 14 mm<br>0.55 in | 39 mm<br>1.54 in   | 14 mm<br>0.55 in | 74.8 mm<br>2.94 in  | 50.4 mm<br>1.98 in | 187 mm<br>7.36 in  | F05 F07  | 8 mm<br>0.31 in  | 10 mm<br>0.39 in | 180  | 276    | 240    |
| 2"     | 47.6 mm<br>1.87 in | 156 mm<br>6.14 in | 223 mm<br>8.78 in   | 86.2 mm<br>3.39 in  | 43 mm<br>1.69 in | 14 mm<br>0.55 in | 42 mm<br>1.65 in   | 14 mm<br>0.55 in | 83.5 mm<br>3.29 in  | 63.8 mm<br>2.51 in | 187 mm<br>7.36 in  | F05 F07  | 8 mm<br>0.31 in  | 10 mm<br>0.39 in | 250  | 552    | 480    |
| 2-1/2" | 60.3 mm<br>2.37 in | 197 mm<br>7.76 in | 250.4 mm<br>9.86 in | 109.2 mm<br>4.3 in  | 53 mm<br>2.09 in | 17 mm<br>0.67 in | 48 mm<br>1.89 in   | 17 mm<br>0.67 in | 108.8 mm<br>4.28 in | 77.6 mm<br>3.06 in | 310 mm<br>12.2 in  | F07 F10  | 10 mm<br>0.39 in | 12 mm<br>0.47 in | 480  | 747    | 650    |
| 3"     | 73 mm<br>2.87 in   | 229 mm<br>9.02 in | 302 mm<br>11.89 in  | 116.2 mm<br>4.57 in | 53 mm<br>2.09 in | 17 mm<br>0.67 in | 48.7 mm<br>1.92 in | 17 mm<br>0.67 in | 118.3 mm<br>4.66 in | 91 mm<br>3.58 in   | 310 mm<br>12.2 in  | F07 F10  | 10 mm<br>0.39 in | 12 mm<br>0.47 in | 750  | 1322   | 1150   |
| 4"     | 97.4 mm<br>3.83 in | 241 mm<br>9.49 in | 317.5 mm<br>12.5 in | 133.5 mm<br>5.26 in | 56 mm<br>2.2 in  | 22 mm<br>0.87 in | 34 mm<br>1.34 in   | 22 mm<br>0.87 in | 153.8 mm<br>6.06 in | 119 mm<br>4.69 in  | 400 mm<br>15.75 in | F10 F12  | 12 mm<br>0.47 in | 14 mm<br>0.55 in | 1100 | 1609   | 1400   |

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**Pressure To Temperature Rating****Material Specification**

| #  | Part              | Material         | Standard           |
|----|-------------------|------------------|--------------------|
| 1  | Body              | Stainless Steel  | ASTM-A351 Gr. CF8M |
| 2  | Ends              | Stainless Steel  | ASTM-A351 Gr. CF8M |
| 3  | Seat              | Stainless Steel  | 15% RTFE           |
| 4  | Ball              | Stainless Steel  | ASTM-A351 Gr. CF8M |
| 5  | Stem              | Stainless Steel  | 316SS              |
| 6  | Gasket            | 15% RTFE         | -                  |
| 7  | Thrust Washer     | PTFE +25% Carbon | -                  |
| 8  | Stem Packing      | 15% RTFE         | -                  |
| 9  | Gland             | Stainless Steel  | 304SS              |
| 10 | Belleville Washer | Stainless Steel  | SUS 304-CSP        |
| 11 | Stem Nut          | Stainless Steel  | 304SS              |
| 12 | Handle            | Stainless Steel  | 304SS              |
| 13 | Handle Nut        | Stainless Steel  | 304SS              |
| 14 | Gasket            | 15% RTFE         | -                  |
| 15 | Handle Sleeve     | Vinyl            | -                  |
| 16 | Locking Washer    | Stainless Steel  | SUS 304-CSP        |
| 17 | Thrust Washer     | PTFE +25% Carbon | -                  |
| 18 | End Cap           | Stainless Steel  | ASTM-A351 Gr. CF8M |
| 19 | O-Ring            | Viton            | Viton              |

**Flow Pattern**

| PORT \ TURN | 0° | 90° |
|-------------|----|-----|
|             | L  | T   |
| L           |    |     |
| T           |    |     |

**Description**

Suitable for a full range of water, gas, steam, petrochemical and general use/utility services and applications. Cavity free.

**Working Pressure**

- 1000 WOG

**End Connection**

- Threaded (NPT)

**Standard**

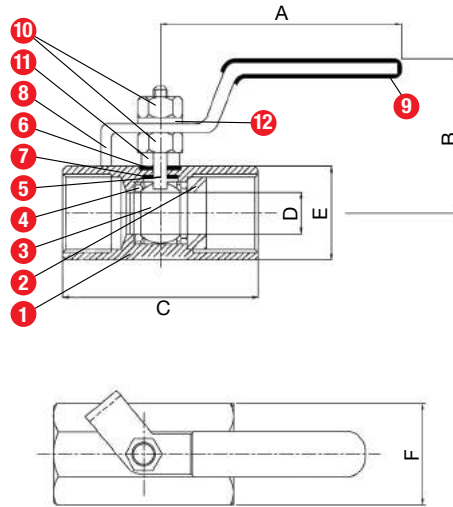
- ASTM A351-CF8M
- Direct mounting pad for ISO Std 5211

**Dimensions**

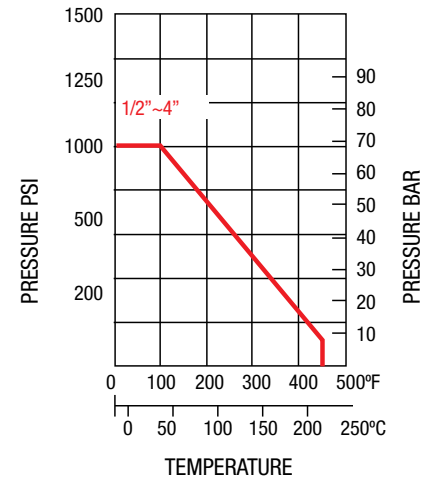
| SIZE<br>NPS | Port              | L                   | L5                 | E                   | H                   | H1               | H4                 | C                | Y                  | ISO 5211 |     | Z1              | Z                | TORQUE |        |
|-------------|-------------------|---------------------|--------------------|---------------------|---------------------|------------------|--------------------|------------------|--------------------|----------|-----|-----------------|------------------|--------|--------|
|             |                   |                     |                    |                     |                     |                  |                    |                  |                    | ØK1      | ØK  |                 |                  | kgf-cm | in-lbs |
| 1/4"        | 11 mm<br>0.43 in  | 75.7 mm<br>2.98 in  | 37.3 mm<br>1.47 in | 112 mm<br>4.41 in   | 77.5 mm<br>3.05 in  | 9 mm<br>0.35 in  | 38.2 mm<br>1.5 in  | 9 mm<br>0.35 in  | 12 mm<br>0.47 in   | F05      | F07 | 7 mm<br>0.28 in | 9 mm<br>0.35 in  | 65     | 57     |
| 3/8"        | 11 mm<br>0.43 in  | 75.7 mm<br>2.98 in  | 37.3 mm<br>1.47 in | 112 mm<br>4.41 in   | 77.5 mm<br>3.05 in  | 9 mm<br>0.35 in  | 38.2 mm<br>1.5 in  | 9 mm<br>0.35 in  | 12 mm<br>0.47 in   | F05      | F07 | 7 mm<br>0.28 in | 9 mm<br>0.35 in  | 73     | 64     |
| 1/2"        | 12.7 mm<br>0.5 in | 75.7 mm<br>2.98 in  | 37.3 mm<br>1.47 in | 112 mm<br>4.41 in   | 77.5 mm<br>3.05 in  | 9 mm<br>0.35 in  | 38.2 mm<br>1.5 in  | 9 mm<br>0.35 in  | 12 mm<br>0.47 in   | F05      | F07 | 7 mm<br>0.28 in | 9 mm<br>0.35 in  | 80     | 70     |
| 3/4"        | 16 mm<br>0.63 in  | 86.6 mm<br>3.41 in  | 44.7 mm<br>1.76 in | 112 mm<br>4.41 in   | 82 mm<br>3.23 in    | 9 mm<br>0.35 in  | 45.2 mm<br>1.78 in | 9 mm<br>0.35 in  | 12 mm<br>0.47 in   | F05      | F07 | 7 mm<br>0.28 in | 9 mm<br>0.35 in  | 130    | 113    |
| 1"          | 20 mm<br>0.79 in  | 102.4 mm<br>4.03 in | 51.4 mm<br>2.02 in | 136.5 mm<br>5.37 in | 93.7 mm<br>3.69 in  | 11 mm<br>0.43 in | 56.5 mm<br>2.22 in | 11 mm<br>0.43 in | 15.8 mm<br>0.62 in | F05      | F07 | 7 mm<br>0.28 in | 9 mm<br>0.35 in  | 269    | 234    |
| 1-1/4"      | 25 mm<br>0.98 in  | 118.2 mm<br>4.65 in | 57.7 mm<br>2.27 in | 188 mm<br>7.4 in    | 101.1 mm<br>3.98 in | 11 mm<br>0.43 in | 61.9 mm<br>2.44 in | 11 mm<br>0.43 in | 15.8 mm<br>0.62 in | F05      | F07 | 7 mm<br>0.28 in | 9 mm<br>0.35 in  | 350    | 305    |
| 1-1/2"      | 32 mm<br>1.26 in  | 125.8 mm<br>4.95 in | 62.7 mm<br>2.47 in | 197.5 mm<br>7.78 in | 120.3 mm<br>4.74 in | 14 mm<br>0.55 in | 78.3 mm<br>3.08 in | 14 mm<br>0.55 in | 20.8 mm<br>0.82 in | F07      | F10 | 9 mm<br>0.35 in | 11 mm<br>0.43 in | 538    | 468    |
| 2"          | 38.1 mm<br>1.5 in | 149 mm<br>5.87 in   | 74.6 mm<br>2.94 in | 197.5 mm<br>7.78 in | 129.9 mm<br>5.11 in | 14 mm<br>0.55 in | 87.4 mm<br>3.44 in | 14 mm<br>0.55 in | 20.8 mm<br>0.82 in | F07      | F10 | 9 mm<br>0.35 in | 11 mm<br>0.43 in | 940    | 818    |

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# B06



**Pressure To Temperature Rating**  
(1/2"–4")



## Description

Suitable for a full range of water, gas, steam, petrochemical and general use/utility services and applications.

## Working Pressure

- 2000 WOG

## End Connection

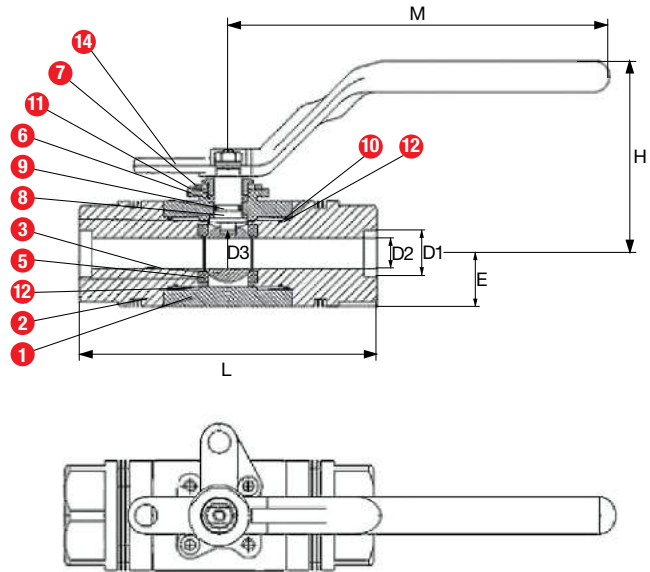
- Threaded (NPT)

## Standard

- ASTM A105N
- NACE MR0175

| Dimensions |                   |                    |                    |                    |                    |                    |           |        |
|------------|-------------------|--------------------|--------------------|--------------------|--------------------|--------------------|-----------|--------|
| SIZE       | A                 | B                  | C                  | D                  | E                  | F                  | CV Factor | Weight |
| NPS        |                   |                    |                    |                    |                    |                    |           | lbs    |
| 1/4"       | 61 mm<br>2.4 in   | 29.5 mm<br>1.16 in | 41.3 mm<br>1.63 in | 5 mm<br>0.2 in     | 21 mm<br>0.83 in   | 24.1 mm<br>0.95 in | 1.5       | 0.46   |
| 3/8"       | 79 mm<br>3.11 in  | 34.5 mm<br>1.36 in | 44 mm<br>1.73 in   | 7.2 mm<br>0.28 in  | 23 mm<br>0.91 in   | 26.4 mm<br>1.04 in | 3.5       | 0.49   |
| 1/2"       | 108 mm<br>4.25 in | 63 mm<br>2.48 in   | 57.2 mm<br>2.25 in | 9 mm<br>0.35 in    | 29 mm<br>1.14 in   | 33.3 mm<br>1.31 in | 5.7       | 0.64   |
| 3/4"       | 110 mm<br>4.33 in | 65 mm<br>2.56 in   | 65.1 mm<br>2.56 in | 12.5 mm<br>0.49 in | 35 mm<br>1.38 in   | 40.3 mm<br>1.59 in | 10        | 0.93   |
| 1"         | 122 mm<br>4.8 in  | 68 mm<br>2.68 in   | 71 mm<br>2.8 in    | 15 mm<br>0.59 in   | 41 mm<br>1.61 in   | 47.2 mm<br>1.86 in | 16        | 1.57   |
| 1 1/4"     | 145 mm<br>5.71 in | 79.5 mm<br>3.13 in | 92.1 mm<br>3.63 in | 20 mm<br>0.79 in   | 55 mm<br>2.17 in   | 63.4 mm<br>2.5 in  | 25        | 2.34   |
| 1 1/2"     | 148 mm<br>5.83 in | 84 mm<br>3.31 in   | 98.4 mm<br>3.87 in | 25 mm<br>0.98 in   | 57 mm<br>2.24 in   | 65.7 mm<br>2.59 in | 40        | 3.70   |
| 2"         | 148 mm<br>5.83 in | 92.5 mm<br>3.64 in | 114.3 mm<br>4.5 in | 32 mm<br>1.26 in   | 73.5 mm<br>2.89 in | 84.7 mm<br>3.33 in | 62        | 5.97   |

| Material Specification |               |                 |          |
|------------------------|---------------|-----------------|----------|
| #                      | Part          | Material        | Standard |
| 1                      | Body          | Carbon Steel    | A108     |
| 2                      | Insert        | Carbon Steel    | A108     |
| 3                      | Ball          | Stainless Steel | AISI 316 |
| 4                      | Seat          | PTFE +15% G/F   | -        |
| 5                      | Stem          | Stainless Steel | AISI 316 |
| 6                      | Thrust Washer | PTFE            | -        |
| 7                      | Stem Seal     | PTFE            | -        |
| 8                      | Handle        | Stainless Steel | AISI 304 |
| 9                      | Handle Sleeve | Vinyl           | -        |
| 10                     | Nut           | Stainless Steel | 304SS    |
| 11                     | Washer        | Steel           | WCB      |
| 12                     | Spring Washer | Stainless Steel | 304SS    |

**Description**

Suitable for a full range of water, gas, steam, petrochemical and general use/utility services and applications.

**Working Pressure**

- BT3: 3000 WOG
- BT6: 6000 WOG

**End Connection**

- Threaded (NPT)
- Socket Weld

**Standard**

- Tested to API 598
- API 607 Fire-safe
- NACE MR0175

| Dimensions    |                 |                  |                 |                |                 |                  |                 |                 |                 |            |
|---------------|-----------------|------------------|-----------------|----------------|-----------------|------------------|-----------------|-----------------|-----------------|------------|
| Size          | L               |                  |                 |                |                 |                  |                 |                 |                 |            |
| NPS           | NPT             | SW               | NPT x SW        | E              | H               | D1               | D2              | D3              | M               | Torque lbs |
| 1/2" FP-BT3   | 98mm<br>3.86in  | 127mm<br>5in     | 113mm<br>4.45in | 19mm<br>0.75in | 83mm<br>3.27in  | 21.8mm<br>0.86in | 12.7mm<br>0.5in | 12.7mm<br>0.5in | 160mm<br>6.3in  | 156        |
| 1/2" FP-BT6   | 98mm<br>3.86in  | 127mm<br>5in     | 119mm<br>4.69in | 19mm<br>0.75in | 83mm<br>3.27in  | 21.8mm<br>0.86in | 12.7mm<br>0.5in | 12.7mm<br>0.5in | 160mm<br>6.3in  | 214        |
| 3/4" FP       | 108mm<br>4.25in | 172mm<br>6.77in  | 140mm<br>5.51in | 24mm<br>0.94in | 90mm<br>3.54in  | 27.8mm<br>1.09in | 19mm<br>0.75in  | 19mm<br>0.75in  | 160mm<br>6.3in  | 358        |
| 3/4" RP       | 111mm<br>4.37in | 172mm<br>6.77in  | 140mm<br>5.51in | 19mm<br>0.75in | 83mm<br>3.27in  | 27.8mm<br>1.09in | 19mm<br>0.75in  | 12.7mm<br>0.5in | 160mm<br>6.3in  | 156        |
| 1" FP         | 108mm<br>4.25in | 172mm<br>6.77in  | 152mm<br>5.98in | 27mm<br>1.06in | 94mm<br>3.7in   | 48.8mm<br>1.92in | 25mm<br>0.98in  | 25mm<br>0.98in  | 200mm<br>7.87in | 441        |
| 1" RP-BT3     | 108mm<br>4.25in | 172mm<br>6.77in  | 140mm<br>5.51in | 24mm<br>0.94in | 90mm<br>3.54in  | 48.8mm<br>1.92in | 25mm<br>0.98in  | 19mm<br>0.75in  | 160mm<br>6.3in  | 358        |
| 1" RP-BT6     | 108mm<br>4.25in | 172mm<br>6.77in  | 152mm<br>5.98in | 24mm<br>0.94in | 90mm<br>3.54in  | 48.8mm<br>1.92in | 25mm<br>0.98in  | 19mm<br>0.75in  | 160mm<br>6.3in  | 560        |
| 1 1/2" FP     | 159mm<br>6.26in | 217mm<br>8.54in  | 188mm<br>7.4in  | 37mm<br>1.46in | 122mm<br>4.8in  | 33.9mm<br>1.33in | 38.1mm<br>1.5in | 38.1mm<br>1.5in | 250mm<br>9.84in | 885        |
| 1 1/2" RP-BT3 | 159mm<br>6.26in | 217mm<br>8.54in  | 188mm<br>7.4in  | 27mm<br>1.06in | 94mm<br>3.7in   | 33.9mm<br>1.33in | 38.1mm<br>1.5in | 25mm<br>0.98in  | 200mm<br>7.87in | 441        |
| 1 1/2" RP-BT6 | 159mm<br>6.26in | 217mm<br>8.54in  | 201mm<br>7.91in | 27mm<br>1.06in | 94mm<br>3.7in   | 33.9mm<br>1.33in | 38.1mm<br>1.5in | 25mm<br>0.98in  | 200mm<br>7.87in | 841        |
| 2" FP         | 159mm<br>6.26in | 324mm<br>12.76in | 241mm<br>9.49in | 43mm<br>1.69in | 150mm<br>5.91in | 61.2mm<br>2.41in | 50mm<br>1.97in  | 50mm<br>1.97in  | 325mm<br>12.8in | 2847       |
| 2" RP-BT3     | 159mm<br>6.26in | 217mm<br>8.54in  | 188mm<br>7.4in  | 37mm<br>1.46in | 122mm<br>4.8in  | 61.2mm<br>2.41in | 50mm<br>1.97in  | 38.1mm<br>1.5in | 250mm<br>9.84in | 885        |
| 2" RP-BT6     | 159mm<br>6.26in | 217mm<br>8.54in  | 201mm<br>7.91in | 37mm<br>1.46in | 122mm<br>4.8in  | 61.2mm<br>2.41in | 50mm<br>1.97in  | 38.1mm<br>1.5in | 250mm<br>9.84in | 1290       |

| Material Specification |                     |                 |                              |
|------------------------|---------------------|-----------------|------------------------------|
| #                      | Part                | Material        | Standard                     |
| 1                      | Body                | Carbon Steel    | A350 LF2                     |
| 2                      | Cap                 | Carbon Steel    | A350 LF2                     |
| 3                      | Ball                | Stainless Steel | CF8M / 316SS / 17/4 PH       |
| 4                      | Stem                | Stainless Steel | 316SS / A564 Gr. 630 17/4 PH |
| 5                      | Seat<br>*NPT valves | PEEK            | -                            |
| 6                      | Packing Ring        | Stainless Steel | 304SS                        |
| 7                      | Gland               | Carbon Steel    | -                            |
| 8                      | Thrust Washer       | PEEK            | -                            |
| 9                      | Packing             | Graphite        | -                            |
| 10                     | O-Ring              | Viton-B         | -                            |
| 11                     | O-Ring              | Viton-B         | -                            |
| 12                     | Gasket              | Graphite        | -                            |
| 13                     | Belleville Washer   | Stainless Steel | 302SS                        |
| 14                     | Handle              | Steel           | A216 WCB                     |

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# Industrial Ball Valve Index

## Z Series Stainless & Carbon Steel



## Code Index

ZR1 | 050 | A | 1 | F | 1 | P | H | 00  
 ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | ⑧ | ⑨

### ① Code and Class

**ZR1** - Reduced port class 150  
**ZR3** - Reduced port class 300  
**ZR6** - Reduced port class 600  
**ZF1** - Full port class 150  
**ZF3** - Full port class 300  
**ZF6** - Full port class 600

### ② Size

**050** - 1/2"; **075** - 3/4"; **001** - 1";  
**150** - 1½"; **002** - 2"; **250** - 2½";  
**003** - 3"; **004** - 4"; **006** - 6"; **008** - 8"

### ③ Type

**A** - Floating ball split body  
**B** - Floating ball uni-body  
**L** - 3-Way L port  
**T** - 3-Way T port

### ④ Type

**1** - ASTM A216 WCB  
**2** - ASTM A325 LCC  
**3** - ASTM A351 CF8M  
**4** - A105N  
**5** - A50 LF2

### ⑤ End Connection

**F** - Raised face flanged\*  
**R** - Ring joint flanged ends  
**B** - Butt-welded ends

### ⑥ Trim Material

**1** - Body + 3ENC  
**2** - 304SS  
**3** - 316SS\*

### ⑦ Seat Material

**P** - PTFE  
**R** - RTFE\*  
**N** - Nylon  
**K** - PEEK  
**D** - Devlon

### ⑧ Operator

**H** - Handle/Lever  
**G** - GearOperator  
**B** - Bare Stem

### ⑨ Special Requirements

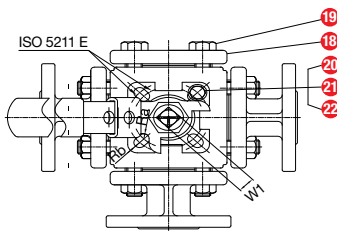
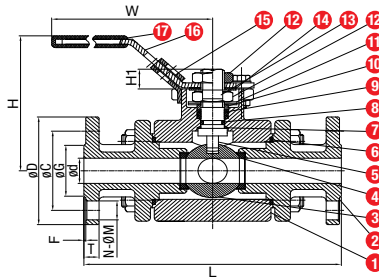
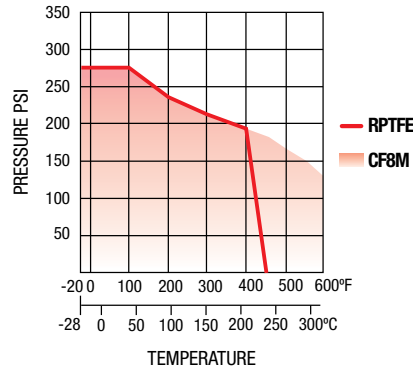
**00** - Standard Requirement

\*Denotes standard stock trim.



## Flow Pattern

| PORT TYPE | 1          | 2          | 3          | 4          |
|-----------|------------|------------|------------|------------|
| L         | 1 2<br>3 3 | 1 2<br>3 3 | 1 2<br>3 3 | 1 2<br>3 3 |
| T         | 1 2<br>3 3 | 1 2<br>3 3 | 1 2<br>3 3 | 1 2<br>3 3 |

Pressure To Temperature Rating  
(1/2"-8")

## Material Specification

| #  | Part           | Material        | Standard |
|----|----------------|-----------------|----------|
| 1  | Body           | Stainless Steel | CF8M     |
| 2  | Cap            | Stainless Steel | CF8M     |
| 3  | Ball           | Stainless Steel | CF8M     |
| 4  | Seat           | R-PTFE          | -        |
| 5  | Stem           | Stainless Steel | SUS316   |
| 6  | Gasket         | R-PTFE          | -        |
| 7  | Thrust Washer  | Stainless Steel | TFM4215  |
| 8  | O-Ring         | Viton           | -        |
| 9  | Packing        | R-PTFE          | -        |
| 10 | Gland          | Stainless Steel | SUS304   |
| 11 | Spring Washer  | Stainless Steel | SUS301   |
| 12 | Stem Nut       | Stainless Steel | SUS304   |
| 13 | Stop Washer    | Stainless Steel | SUS304   |
| 14 | Handle Washer  | Stainless Steel | SUS304   |
| 15 | Locking Device | Stainless Steel | SUS304   |
| 16 | Handle         | Stainless Steel | SUS304   |
| 17 | Plastic Cover  | Plastic         | -        |
| 18 | CAP-A          | Stainless Steel | CF8M     |
| 19 | Bolt           | Stainless Steel | SUS304   |
| 20 | Stop Pin       | Stainless Steel | SUS304   |
| 21 | Bolt           | Stainless Steel | SUS304   |
| 22 | Nut            | Stainless Steel | SUS304   |

## Description

Suitable for a full range of water, gas, steam, petrochemical and general use/utility services and applications.

## Working Pressure

- Class 150

## End Connection

- Flanged

## Standard

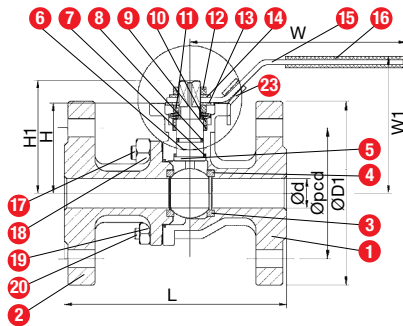
- ASME/ANSI Class 150-B16.34
- Markings per MSS-SP25

## Dimensions

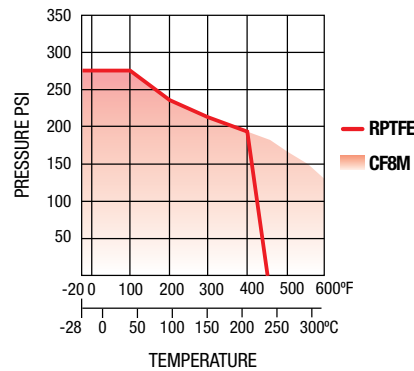
| Size |        | d                 | D                  | C                    | G                  | T                  | f                 | N               | M                | L                  | H                  | W                   | E                            | H1               | W1               | Ma               | Ra | Rb   | ISO 5211 |
|------|--------|-------------------|--------------------|----------------------|--------------------|--------------------|-------------------|-----------------|------------------|--------------------|--------------------|---------------------|------------------------------|------------------|------------------|------------------|----|------|----------|
| DIN  | ANSI   |                   |                    |                      |                    |                    |                   |                 |                  |                    |                    |                     |                              |                  |                  |                  |    |      |          |
| 15   | 1/2"   | 15 mm<br>0.59 in  | 89 mm<br>3.5 in    | 60.5 mm<br>2.38 in   | 35 mm<br>1.38 in   | 11.1 mm<br>0.44 in | 1.6 mm<br>0.06 in | 4 mm<br>0.16 in | 16 mm<br>0.63 in | 148 mm<br>5.83 in  | 80 mm<br>3.15 in   | 123 mm<br>4.84 in   | 36 - 42 mm<br>1.42 - 1.65 in | 9 mm<br>0.35 in  | 9 mm<br>0.35 in  | -                | R3 | R3   | F03-F04  |
| 20   | 3/4"   | 20 mm<br>0.79 in  | 98 mm<br>3.86 in   | 70 mm<br>2.76 in     | 43 mm<br>1.69 in   | 11.1 mm<br>0.44 in | 1.6 mm<br>0.06 in | 4 mm<br>0.16 in | 16 mm<br>0.63 in | 153 mm<br>6.02 in  | 84 mm<br>3.31 in   | 123 mm<br>4.84 in   | 36 - 42 mm<br>1.42 - 1.65 in | 9 mm<br>0.35 in  | 9 mm<br>0.35 in  | -                | R3 | R3   | F03-F04  |
| 25   | 1"     | 25 mm<br>0.98 in  | 108 mm<br>4.25 in  | 79.5 mm<br>3.13 in   | 51 mm<br>2.01 in   | 11.1 mm<br>0.44 in | 1.6 mm<br>0.06 in | 4 mm<br>0.16 in | 16 mm<br>0.63 in | 168 mm<br>6.61 in  | 96 mm<br>3.78 in   | 153 mm<br>6.02 in   | 42 - 50 mm<br>1.65 - 1.97 in | 11 mm<br>0.43 in | 11 mm<br>0.43 in | -                | R3 | R3.5 | F04-F05  |
| 40   | 1 1/2" | 40 mm<br>1.57 in  | 127 mm<br>5 in     | 98.5 mm<br>3.88 in   | 73 mm<br>2.87 in   | 14.3 mm<br>0.56 in | 1.6 mm<br>0.06 in | 4 mm<br>0.16 in | 16 mm<br>0.63 in | 221 mm<br>8.7 in   | 171 mm<br>6.73 in  | 403 mm<br>15.87 in  | 70 mm<br>2.76 in             | 19 mm<br>0.75 in | 17 mm<br>0.67 in | 10 mm<br>0.39 in | -  | -    | F07      |
| 50   | 2"     | 50 mm<br>1.97 in  | 152 mm<br>5.98 in  | 120.5 mm<br>4.74 in  | 92 mm<br>3.62 in   | 15.9 mm<br>0.63 in | 1.6 mm<br>0.06 in | 4 mm<br>0.16 in | 19 mm<br>0.75 in | 254 mm<br>10 in    | 176 mm<br>6.93 in  | 403 mm<br>15.87 in  | 70 mm<br>2.76 in             | 19 mm<br>0.75 in | 17 mm<br>0.67 in | 10 mm<br>0.39 in | -  | -    | F07      |
| 65   | 2 1/2" | 65 mm<br>2.56 in  | 178 mm<br>7.01 in  | 139.5 mm<br>5.49 in  | 105 mm<br>4.13 in  | 17.5 mm<br>0.69 in | 1.6 mm<br>0.06 in | 4 mm<br>0.16 in | 19 mm<br>0.75 in | 300 mm<br>11.81 in | 208 mm<br>8.19 in  | 504 mm<br>19.84 in  | 102 mm<br>4.02 in            | 24 mm<br>0.94 in | 22 mm<br>0.87 in | 12 mm<br>0.47 in | -  | -    | F10      |
| 80   | 3"     | 76 mm<br>2.99 in  | 190 mm<br>7.48 in  | 152.5 mm<br>6 in     | 127 mm<br>5 in     | 19.1 mm<br>0.75 in | 1.6 mm<br>0.06 in | 4 mm<br>0.16 in | 19 mm<br>0.75 in | 305 mm<br>12.01 in | 216 mm<br>8.5 in   | 504 mm<br>19.84 in  | 102 mm<br>4.02 in            | 24 mm<br>0.94 in | 22 mm<br>0.87 in | 12 mm<br>0.47 in | -  | -    | F10      |
| 100  | 4"     | 96 mm<br>3.78 in  | 229 mm<br>9.02 in  | 190.5 mm<br>7.5 in   | 157 mm<br>6.18 in  | 23.9 mm<br>0.94 in | 1.6 mm<br>0.06 in | 8 mm<br>0.31 in | 19 mm<br>0.75 in | 369 mm<br>14.53 in | 236 mm<br>9.29 in  | 654 mm<br>25.75 in  | 102 mm<br>4.02 in            | 24 mm<br>0.94 in | 22 mm<br>0.87 in | 12 mm<br>0.47 in | -  | -    | F10      |
| 150  | 6"     | 148 mm<br>5.83 in | 279 mm<br>10.98 in | 241.5 mm<br>9.51 in  | 216 mm<br>8.5 in   | 25.4 mm<br>1 in    | 1.6 mm<br>0.06 in | 8 mm<br>0.31 in | 22 mm<br>0.87 in | 480 mm<br>18.9 in  | 329 mm<br>12.95 in | 800 mm<br>31.5 in   | 140 mm<br>5.51 in            | 38 mm<br>1.5 in  | 36 mm<br>1.42 in | 18 mm<br>0.71 in | -  | -    | F14      |
| 200  | 8"     | 200 mm<br>7.87 in | 343 mm<br>13.5 in  | 298.5 mm<br>11.75 in | 270 mm<br>10.63 in | 28.6 mm<br>1.13 in | 1.6 mm<br>0.06 in | 8 mm<br>0.31 in | 22 mm<br>0.87 in | 630 mm<br>24.8 in  | 354 mm<br>13.94 in | 1000 mm<br>39.37 in | 140 mm<br>5.51 in            | 40 mm<br>1.57 in | 36 mm<br>1.42 in | 18 mm<br>0.71 in | -  | -    | F14      |

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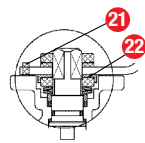
## ZF1



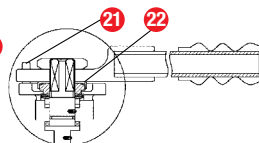
### Pressure To Temperature Rating (1/2"–6")



2½"–4"



5"–6" (No lock device)



### Material Specification

| #  | Part              | Material         | Standard |
|----|-------------------|------------------|----------|
| 1  | Body              | Stainless Steel  | CF8M     |
| 2  | Cap               | Stainless Steel  | CF8M     |
| 3  | Ball              | Stainless Steel  | CF8M     |
| 4  | Ball Seat (2)     | 15% R-PTFE       | -        |
| 5  | Joint Gasket      | PTFE +25% Carbon | -        |
| 6  | Stem              | Stainless Steel  | AISI 316 |
| 7  | Thrust Washer     | PTFE +25% Carbon | -        |
| 8  | O-Ring            | Viton            | -        |
| 9  | Stem Packing      | PTFE +25% Carbon | -        |
| 10 | Stem Ring         | Stainless Steel  | AISI 304 |
| 11 | Belleville Washer | Stainless Steel  | AISI 304 |
| 12 | Stem Nut (2)      | Stainless Steel  | AISI 304 |
| 13 | Stopper (2)       | Stainless Steel  | AISI 304 |
| 14 | Spring Washer     | Stainless Steel  | AISI 304 |
| 15 | Handle            | Stainless Steel  | AISI 304 |
| 16 | Plastic Cover     | Plastic          | -        |
| 17 | Nut 1             | Stainless Steel  | AISI 304 |
| 18 | Stud Bolt 1       | Stainless Steel  | AISI 304 |
| 19 | Nut 2             | Stainless Steel  | AISI 304 |
| 20 | Stud Bolt 2       | Stainless Steel  | AISI 304 |
| 21 | Stopper Pin       | Stainless Steel  | AISI 304 |
| 22 | Lock Washer       | Stainless Steel  | AISI 304 |
| 23 | Lock Device       | Stainless Steel  | AISI 304 |

### Description

Suitable for a full range of water, gas, steam, petrochemical and general use/utility services and applications.

### Working Pressure

- Class 150

### End Connection

- Flanged

### Standard

- ASME/ANSI Class 150-B16.34
- NACE MR0175

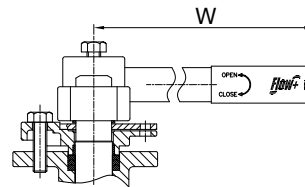
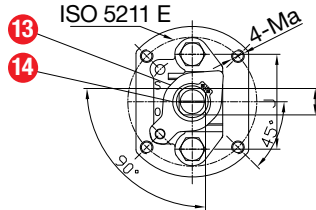
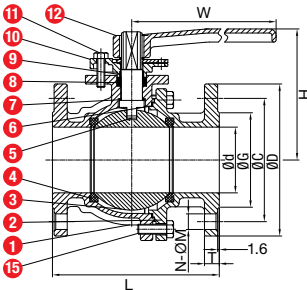
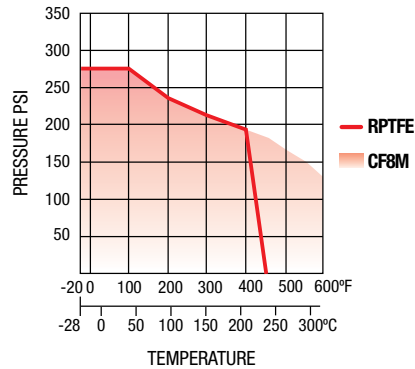
### Dimensions

| Size |        | d                 | d1                 | pcd                 | l                 | h                   | h1                  | w                    | w1                  | v                 | v1                 | x                 | x1                 | Stem dia.        | Torque                | Weight            | CV Factor |
|------|--------|-------------------|--------------------|---------------------|-------------------|---------------------|---------------------|----------------------|---------------------|-------------------|--------------------|-------------------|--------------------|------------------|-----------------------|-------------------|-----------|
| DIN  | ANSI   |                   |                    |                     |                   |                     |                     |                      |                     |                   |                    |                   |                    |                  |                       |                   |           |
| 15   | 1/2"   | 0.59 in<br>15 mm  | 3.5 in<br>89 mm    | 2.38 in<br>60.5 mm  | 4.25 in<br>108 mm | 1.83 in<br>46.5 mm  | 2.20 in<br>56 mm    | 4.3 in<br>110 mm     | 3.50 in<br>89 mm    | 1.65 in<br>42 mm  | 0.24 in<br>6 mm    | 1.97 in<br>50 mm  | 0.28 in<br>7 mm    | 0.35 in<br>9 mm  | 85 lbs<br>9.6 Nm      | 3.6 lbs<br>1.6 kg | 27        |
| 20   | 3/4"   | 0.79 in<br>20 mm  | 3.875 in<br>98 mm  | 2.75 in<br>70 mm    | 4.6 in<br>117 mm  | 2.03 in<br>51.5 mm  | 2.40 in<br>61 mm    | 4.3 in<br>110 mm     | 3.70 in<br>94 mm    | 1.97 in<br>50 mm  | 0.3 in<br>7.6 mm   | 2.76 in<br>70 mm  | 0.38 in<br>9.6 mm  | 0.35 in<br>9 mm  | 110 lbs<br>12.4 Nm    | 4.5 lbs<br>2 kg   | 50        |
| 25   | 1"     | 0.98 in<br>25 mm  | 4.25 in<br>108 mm  | 3.125 in<br>79.5 mm | 5 in<br>127 mm    | 2.26 in<br>57.5     | 2.64 in<br>67 mm    | 5.35 in<br>136 mm    | 3.74 in<br>95 mm    | 1.97 in<br>50 mm  | 0.3 in<br>7.6 mm   | 2.76 in<br>70 mm  | 0.38 in<br>9.6 mm  | 0.43 in<br>11 mm | 180 lbs<br>20.3 Nm    | 7 lbs<br>3.2 kg   | 95        |
| 40   | 1 1/2" | 1.57 in<br>40 mm  | 5 in<br>127 mm     | 3.875 in<br>98.5 mm | 6.5 in<br>165 mm  | 3.01 in<br>76.5 mm  | 3.62 in<br>92 mm    | 8 in<br>203 mm       | 4.36 in<br>110.7 mm | 2.76 in<br>70 mm  | 0.38 in<br>9.6 mm  | 4.02 in<br>102 mm | 0.44 in<br>11.2 mm | 0.55 in<br>14 mm | 315 lbs<br>35.6 Nm    | 14 lbs<br>6.4 kg  | 280       |
| 50   | 2"     | 1.97 in<br>50 mm  | 6 in<br>152.4 mm   | 4.75 in<br>120.5 mm | 7 in<br>178 mm    | 3.29 in<br>83.5 mm  | 3.90 in<br>99 mm    | 8 in<br>203 mm       | 4.63 in<br>117.7 mm | 2.76 in<br>70 mm  | 0.38 in<br>9.6 mm  | 4.02 in<br>102 mm | 0.44 in<br>11.2 mm | 0.55 in<br>14 mm | 450 in lbs<br>50.8 Nm | 21 lbs<br>9.5 kg  | 490       |
| 65   | 2 1/2" | 2.56 in<br>65 mm  | 7.01 in<br>178 mm  | 5.49 in<br>139.5 mm | 7.48 in<br>190 mm | 4.57 in<br>118.5 mm | 5.39 in<br>137 mm   | 10.93 in<br>277.5 mm | 6.12 in<br>155.5 mm | 4.02 in<br>102 mm | 0.44 in<br>11.2 mm | 4.92 in<br>125 mm | 0.56 in<br>14.3 mm | 0.67 in<br>17 mm | 565 lbs<br>63.8 Nm    | 36 lbs<br>16.3 kg | 750       |
| 80   | 3"     | 3.14 in<br>80 mm  | 7.5 in<br>190.5 mm | 6 in<br>152.5 mm    | 8 in<br>203 mm    | 5.10 in<br>129.5 mm | 5.83 in<br>148 mm   | 10.93 in<br>277.5 mm | 6.56 in<br>166.5 mm | 4.02 in<br>102 mm | 0.44 in<br>11.2 mm | 4.92 in<br>125 mm | 0.56 in<br>14.3 mm | 0.67 in<br>17 mm | 680 lbs<br>76.8 Nm    | 48 lbs<br>22 kg   | 1160      |
| 100  | 4"     | 3.94 in<br>100 mm | 9 in<br>229 mm     | 7.5 in<br>190.5 mm  | 9.06 in<br>230 mm | 5.71 in<br>145 mm   | 6.44 in<br>163.5 mm | 14.86 in<br>377.5 mm | 7.17 in<br>182 mm   | 4.02 in<br>102 mm | 0.44 in<br>11.2 mm | 4.92 in<br>125 mm | 0.56 in<br>14.3 mm | 0.87 in<br>22 mm | 1190 lbs<br>134.5 Nm  | 79 lbs<br>36 kg   | 2200      |
| 150  | 6"     | 5.9 in<br>150 mm  | 15.51 in<br>394 mm | 9.5 in<br>241.5 mm  | 9.06 in<br>230 mm | 6.89 in<br>175 mm   | 8.61 in<br>218.6 mm | 21.65 in<br>550 mm   | 7.17 in<br>182 mm   | 4.92 in<br>125 mm | 0.56 in<br>14.3 mm | 5.51 in<br>140 mm | 0.73 in<br>18.6 mm | 1.06 in<br>27 mm | 2850 lbs<br>322 Nm    | 207 lbs<br>94 kg  | 5100      |

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**Pressure To Temperature Rating**  
(1/2"–12")



| Material Specification |               |                 |          |
|------------------------|---------------|-----------------|----------|
| #                      | Part          | Material        | Standard |
| 1                      | Body          | Stainless Steel | CF8M     |
| 2                      | Cap           | Stainless Steel | CF8M     |
| 3                      | Ball          | Stainless Steel | CF8M     |
| 4                      | Seat          | R-PTFE          | -        |
| 5                      | Stem          |                 | SUS316   |
| 6                      | Gasket        | PTFE            |          |
| 7                      | Thrust Washer | PEEK + PTFE     | -        |
| 8                      | Gland Packing | PTFE            | -        |
| 9                      | Stem Bushing  | PTFE            | -        |
| 10                     | Gland         | Stainless Steel | CF8      |
| 11                     | Gland Bolt    | Stainless Steel | B8       |
| 12                     | Handle        | Ductile Iron    | FCD      |
| 13                     | Stopper       | Stainless Steel | SUS304   |
| 14                     | Snap Ring     | Stainless Steel | SUS304   |
| 15                     | Bolt          | Stainless Steel | B8       |

## Description

Suitable for a full range of water, gas, steam, petrochemical and general use/utility services and applications.

## Working Pressure

- Class 150

## End Connection

- Flanged

## Standard

- ASME/ANSI Class 150 B16.5/10
- NACE MR0175

| Dimensions |        |                    |                    |                      |                    |                    |                    |                    |                     |                  |                   |          |        |
|------------|--------|--------------------|--------------------|----------------------|--------------------|--------------------|--------------------|--------------------|---------------------|------------------|-------------------|----------|--------|
| Size       |        | d                  | d                  | c                    | g                  | t                  | l                  | h                  | w                   | w1               | j                 | ISO 5211 | Torque |
| DIN        | ANSI   |                    |                    |                      |                    |                    |                    |                    |                     |                  |                   |          |        |
| 15         | 1/2"   | 15 mm<br>0.59 in   | 89 mm<br>3.5 in    | 60.5 mm<br>2.38 in   | 35 mm<br>1.38 in   | 11.1 mm<br>0.44 in | 108 mm<br>4.25 in  | 92 mm<br>3.62 in   | 160 mm<br>6.3 in    | 12 mm<br>0.47 in | 50 mm<br>1.97 in  | F04      | 14     |
| 20         | 3/4"   | 20 mm<br>0.79 in   | 98 mm<br>3.86 in   | 70 mm<br>2.76 in     | 43 mm<br>1.69 in   | 11.1 mm<br>0.44 in | 117 mm<br>4.61 in  | 98 mm<br>3.86 in   | 160 mm<br>6.3 in    | 12 mm<br>0.47 in | 50 mm<br>1.97 in  | F04      | 22     |
| 25         | 1"     | 25 mm<br>0.98 in   | 108 mm<br>4.25 in  | 79.5 mm<br>3.13 in   | 51 mm<br>2.01 in   | 11.1 mm<br>0.44 in | 127 mm<br>5 in     | 103 mm<br>4.06 in  | 160 mm<br>6.3 in    | 12 mm<br>0.47 in | 50 mm<br>1.97 in  | F05      | 22     |
| 32         | 1 1/4" | 32 mm<br>1.26 in   | 117 mm<br>4.61 in  | 89.5 mm<br>3.52 in   | 64 mm<br>2.52 in   | 12.7 mm<br>0.5 in  | 140 mm<br>5.51 in  | 107 mm<br>4.21 in  | 160 mm<br>6.3 in    | 12 mm<br>0.47 in | 50 mm<br>1.97 in  | F05      | 25     |
| 40         | 1 1/2" | 40 mm<br>1.57 in   | 127 mm<br>5 in     | 98.5 mm<br>3.88 in   | 73 mm<br>2.87 in   | 14.3 mm<br>0.56 in | 165 mm<br>6.5 in   | 112 mm<br>4.41 in  | 230 mm<br>9.06 in   | 17 mm<br>0.67 in | 62 mm<br>2.44 in  | F07      | 29     |
| 50         | 2"     | 50 mm<br>1.97 in   | 152 mm<br>5.98 in  | 120.5 mm<br>4.74 in  | 92 mm<br>3.62 in   | 15.9 mm<br>0.63 in | 178 mm<br>7.01 in  | 122 mm<br>4.8 in   | 230 mm<br>9.06 in   | 17 mm<br>0.67 in | 62 mm<br>2.44 in  | F07      | 34     |
| 40         | 2 1/2" | 65 mm<br>2.56 in   | 178 mm<br>7.01 in  | 139.5 mm<br>5.49 in  | 105 mm<br>4.13 in  | 17.5 mm<br>0.69 in | 190 mm<br>7.48 in  | 151 mm<br>5.94 in  | 350 mm<br>13.78 in  | 21 mm<br>0.83 in | 75 mm<br>2.95 in  | F07      | 50     |
| 80         | 3"     | 80 mm<br>3.15 in   | 190 mm<br>7.48 in  | 152.5 mm<br>6 in     | 127 mm<br>5 in     | 19.1 mm<br>0.75 in | 203 mm<br>7.99 in  | 161 mm<br>6.34 in  | 350 mm<br>13.78 in  | 21 mm<br>0.83 in | 75 mm<br>2.95 in  | F10      | 75     |
| 100        | 4"     | 100 mm<br>3.94 in  | 229 mm<br>9.02 in  | 190.5 mm<br>7.5 in   | 157 mm<br>6.18 in  | 23.9 mm<br>0.94 in | 229 mm<br>9.02 in  | 175 mm<br>6.89 in  | 350 mm<br>13.78 in  | 21 mm<br>0.83 in | 75 mm<br>2.95 in  | F10      | 100    |
| 125        | 5"     | 125 mm<br>4.92 in  | 254 mm<br>10 in    | 216 mm<br>8.5 in     | 186 mm<br>7.32 in  | 23.9 mm<br>0.94 in | 356 mm<br>14.02 in | 224 mm<br>8.82 in  | 750 mm<br>29.53 in  | 24 mm<br>0.94 in | 89 mm<br>3.5 in   | F12      | 170    |
| 150        | 6"     | 150 mm<br>5.91 in  | 279 mm<br>10.98 in | 241.5 mm<br>9.51 in  | 216 mm<br>8.5 in   | 25.4 mm<br>1 in    | 394 mm<br>15.51 in | 247 mm<br>9.72 in  | 750 mm<br>29.53 in  | 24 mm<br>0.94 in | 89 mm<br>3.5 in   | F12      | 270    |
| 200        | 8"     | 200 mm<br>7.87 in  | 343 mm<br>13.5 in  | 298.5 mm<br>11.75 in | 270 mm<br>10.63 in | 28.6 mm<br>1.13 in | 457 mm<br>17.99 in | 305 mm<br>12.01 in | 1000 mm<br>39.37 in | 32 mm<br>1.26 in | 100 mm<br>3.94 in | F12      | 380    |
| 250        | 10"    | 250 mm<br>9.84 in  | 406 mm<br>15.98 in | 362 mm<br>14.25 in   | 324 mm<br>12.76 in | 30.2 mm<br>1.19 in | 533 mm<br>20.98 in | 327 mm<br>12.87 in | 1000 mm<br>39.37 in | 32 mm<br>1.26 in | 100 mm<br>3.94 in | F14      | 500    |
| 300        | 12"    | 300 mm<br>11.81 in | 483 mm<br>19.02 in | 432 mm<br>17.01 in   | 381 mm<br>15 in    | 31.8 mm<br>1.25 in | 610 mm<br>24.02 in | 355 mm<br>13.98 in | 1000 mm<br>39.37 in | 32 mm<br>1.26 in | 100 mm<br>3.94 in | F14      | 600    |

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## ZF1



## Description

Suitable for a full range of water, gas, steam, petrochemical and general use/utility services and applications.

## Working Pressure

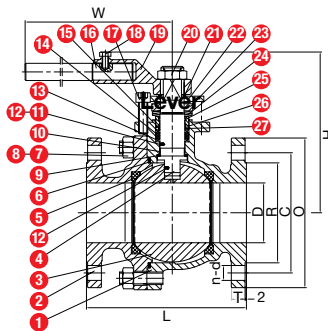
- Class 150

## End Connection

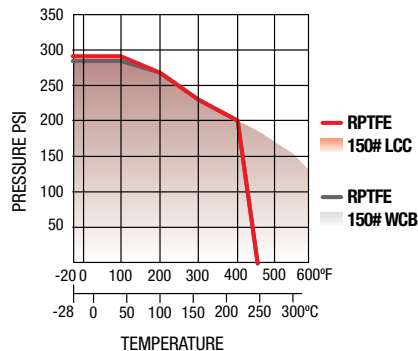
- Flanged

## Standard

- ASME/ANSI Class 150 B16.34
- NACE MR0175
- Fire-safe to API-607, latest Ed.



## Pressure To Temperature Rating



## Lever Operated Material Specification

| #  | Part                    | Carbon Steel (WCB) Material | Low-Temp CS (LCC) Material |
|----|-------------------------|-----------------------------|----------------------------|
| 1  | Body                    | A216 WCB                    | A352 LCC                   |
| 2  | End                     | A216 WCB                    | A352 LCC                   |
| 3  | Ball                    | A182 F316                   | A182 F316                  |
| 4  | Stem                    | A182 F316                   | A182 F316                  |
| 5  | Seat                    | Nylon                       | R-PTFE                     |
| 6  | Body Gasket             | 304 Graphite Spiral Wound   | 304 Graphite Spiral Wound  |
| 7  | Nut                     | A194-2HM                    | A194-2HM                   |
| 8  | Full-threaded Bolt      | A193-B7M                    | A320 L7M                   |
| 9  | Stem Gasket             | PTFE                        | PTFE                       |
| 10 | Stem Bearing            | PTFE                        | PTFE                       |
| 11 | Stem Ball               | A276 304                    | A276 304                   |
| 12 | Anti-static Spring      | A276 304                    | A276 304                   |
| 13 | Stem Firesafe Gasket I  | Flexible Graphite + 316     | Flexible Graphite + 316    |
| 14 | Stem Firesafe Gasket II | Flexible Graphite           | Flexible Graphite          |
| 15 | Packing Gland Bearing   | PTFE                        | PTFE                       |
| 16 | Lever                   | AISI 1020                   | AISI 1020                  |
| 17 | Screw                   | A193-B7M                    | A320 L7M                   |
| 18 | Hex Bolt                | A193-B7M                    | SS                         |
| 19 | Joint                   | A216 WCB                    | A352 LCC                   |
| 20 | Nut                     | AISI 1020                   | AISI 1020                  |
| 21 | Axial Retaining Ring    | AISI 1566                   | AISI 1566                  |
| 22 | Limit Block             | A36                         | A36                        |
| 23 | Nut                     | AISI 1020                   | AISI 1020                  |
| 24 | Belleville Washer       | A276 304                    | A276 304                   |
| 25 | O-Ring                  | Viton                       | Viton                      |
| 26 | O-Ring                  | Viton                       | Viton                      |
| 27 | Packing Bushing         | A276 316                    | A276 316                   |

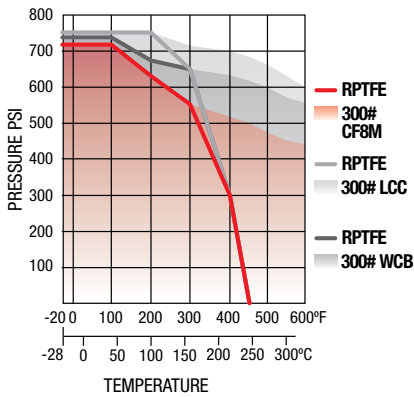
## Dimensions

| Size |          | L                  | D                 | R                     | C                    | O                    | n-d                   | T                    | W                  | H                  | WT                 | Torque             |                      | CV     |
|------|----------|--------------------|-------------------|-----------------------|----------------------|----------------------|-----------------------|----------------------|--------------------|--------------------|--------------------|--------------------|----------------------|--------|
| DIN  | ANSI     |                    |                   |                       |                      |                      |                       |                      |                    |                    |                    | 150 PSI            | 285 PSI              |        |
| 50   | 2 in     | 4.25 in<br>108 mm  | 0.51 in<br>13 mm  | 1.375 in<br>34.93 mm  | 2.375 in<br>60.33 mm | 3.5 in<br>88.9 mm    | 0.625 in<br>4-62 mm   | 0.438 in<br>11.11 mm | 5.91 in<br>150 mm  | 3.19 in<br>81 mm   | 4.85 lbs<br>2.2 kg | 71 lbs<br>8 Nm     | 107 lbs<br>12 Nm     | 24     |
| 20   | 3/4 in   | 4.61 in<br>117 mm  | 0.75 in<br>19 mm  | 1.6875 in<br>42.86 mm | 2.75 in<br>69.85 mm  | 3.875 in<br>98.43 mm | 0.625 in<br>4-62 mm   | 0.5 in<br>12.7 mm    | 5.91 in<br>150 mm  | 3.35 in<br>85 mm   | 5.95 lbs<br>2.7 kg | 80 lbs<br>9 Nm     | 124 lbs<br>14 Nm     | 53     |
| 25   | 1 in     | 5.0 in<br>127 mm   | 0.98 in<br>25 mm  | 2 in<br>50.8 mm       | 3.125 in<br>79.38 mm | 4.25 in<br>107.98 mm | 0.625 in<br>4-62 mm   | 0.56 in<br>14.29 mm  | 7.09 in<br>180 mm  | 3.86 in<br>98 mm   | 9.92 lbs<br>4.5 kg | 142 lbs<br>16 Nm   | 239 lbs<br>27 Nm     | 92     |
| 40   | 1 1/2 in | 6.5 in<br>165 mm   | 1.50 in<br>38 mm  | 2.875 in<br>73.03 mm  | 3.875 in<br>98.43 mm | 5 in<br>127 mm       | 0.625 in<br>4-62 mm   | 0.69 in<br>17.46 mm  | 11.02 in<br>280 mm | 5.24 in<br>133 mm  | 15.43 lbs<br>7 kg  | 292 lbs<br>33 Nm   | 487 lbs<br>55 Nm     | 211    |
| 50   | 2 in     | 7 in<br>178 mm     | 1.97 in<br>50 mm  | 3.625 in<br>92.1 mm   | 4.75 in<br>120.7 mm  | 5.9 in<br>150 mm     | 0.75 in<br>4-19 mm    | 0.562 in<br>14.3 mm  | 9.53 in<br>242 mm  | 6.14 in<br>156 mm  | 22 lbs<br>9.8 kg   | 372 lbs<br>42 Nm   | 620 lbs<br>70 Nm     | 450    |
| 80   | 3 in     | 8 in<br>203 mm     | 2.95 in<br>75 mm  | 5 in<br>127 mm        | 6 in<br>152.4 mm     | 7.48 in<br>190 mm    | 0.69 in<br>4-19 mm    | 0.69 in<br>17.5 mm   | 13.78 in<br>350 mm | 8.07 in<br>205 mm  | 44 lbs<br>20 kg    | 797 lbs<br>90 Nm   | 1328 lbs<br>150 Nm   | 1100   |
| 100  | 4 in     | 9.02 in<br>229 mm  | 3.98 in<br>101 mm | 6.19 in<br>157.2 mm   | 7.5 in<br>190.5 mm   | 9.05 in<br>230 mm    | 0.875 in<br>8-19 mm   | 0.88 in<br>22.3 mm   | 18.11 in<br>460 mm | 8.858 in<br>225 mm | 77 lbs<br>35 kg    | 1328 lbs<br>150 Nm | 2168 lbs<br>245 Nm   | 2200   |
| 150  | 6 in     | 15.51 in<br>394 mm | 5.94 in<br>151 mm | 8.5 in<br>215.9 mm    | 9.5 in<br>241.3 mm   | 11.02 in<br>280 mm   | 0.94 in<br>8-22.5 mm  | 0.94 in<br>23.9 mm   | 29.53 in<br>750 mm | 12.48 in<br>317 mm | 211 lbs<br>96 kg   | 3009 lbs<br>340 Nm | 4956 lbs<br>560 Nm   | 5200   |
| 200  | 8 in     | 18 in<br>457 mm    | 7.95 in<br>202 mm | 10.625 in<br>269.9 mm | 11.75 in<br>298.5 mm | 13.58 in<br>345 mm   | 0.885 in<br>8-22.5 mm | 1.06 in<br>27 mm     | -                  | -                  | 364 lbs<br>165 kg  | 7213 lbs<br>815 Nm | 12001 lbs<br>1356 Nm | 10,000 |

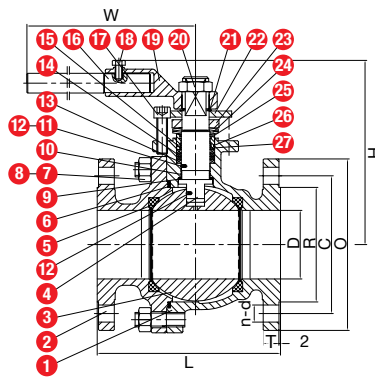
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### Pressure To Temperature Rating



### Lever



### Lever Operated Material Specification

| #  | Part                    | Carbon Steel (WCB) Material | Low-Temp CS (LCC) Material | Stainless Steel (316SS) Material |
|----|-------------------------|-----------------------------|----------------------------|----------------------------------|
| 1  | Body                    | A216 WCB                    | A352 LCC                   | A351 CF8M                        |
| 2  | End                     | A216 WCB                    | A352 LCC                   | A351 CF8M                        |
| 3  | Ball                    | A182 F316                   | A182 F316                  | A182 F316                        |
| 4  | Stem                    | A182 F316                   | A182 F316                  | A182 F316                        |
| 5  | Seat                    | Nylon                       | R-PTFE                     | R-PTFE                           |
| 6  | Body Gasket             | 304 Graphite Spiral Wound   | 304 Graphite Spiral Wound  | 304 Graphite Spiral Wound        |
| 7  | Nut                     | A194-2HM                    | A194-2HM                   | A194-8M                          |
| 8  | Full-threaded Bolt      | A193-B7M                    | A320 L7M                   | A320 B8M                         |
| 9  | Stem Gasket             | PTFE                        | PTFE                       | PTFE                             |
| 10 | Stem Bearing            | PTFE                        | PTFE                       | PTFE                             |
| 11 | Stem Ball               | A276 304                    | A276 304                   | A276 304                         |
| 12 | Anti-static Spring      | A276 304                    | A276 304                   | A276 304                         |
| 13 | Stem Firesafe Gasket I  | Flexible Graphite + 316     | Flexible Graphite + 316    | Flexible Graphite + 316          |
| 14 | Stem Firesafe Gasket II | Flexible Graphite           | Flexible Graphite          | Flexible Graphite                |
| 15 | Packing Gland Bearing   | PTFE                        | PTFE                       | PTFE                             |
| 16 | Lever                   | AISI 1020                   | AISI 1020                  | AISI 1020 + Zn                   |
| 17 | Screw                   | A193-B7M                    | A320 L7M                   | A193B8M                          |
| 18 | Hex Bolt                | A193-B7M                    | SS                         | SS                               |
| 19 | Joint                   | A216 WCB                    | A352 LCC                   | A216 WCB + Zn                    |
| 20 | Nut                     | AISI 1020                   | AISI 1020                  | SS                               |
| 21 | Axial Retaining Ring    | AISI 1566                   | AISI 1566                  | AISI 1566                        |
| 22 | Limit Block             | A36                         | A36                        | A36                              |
| 23 | Nut                     | AISI 1020                   | AISI 1020                  | SS                               |
| 24 | Belleville Washer       | A276 304                    | A276 304                   | A276 304                         |
| 25 | O-Ring                  | Viton                       | Viton                      | Viton                            |
| 26 | O-Ring                  | Viton                       | Viton                      | Viton                            |
| 27 | Packing Bushing         | A276 316                    | A276 316                   | A276 316                         |

### Description

Suitable for a full range of water, gas, steam, petrochemical and general use/utility services and applications.

### Working Pressure

- Class 300

### End Connection

- Flanged

### Standard

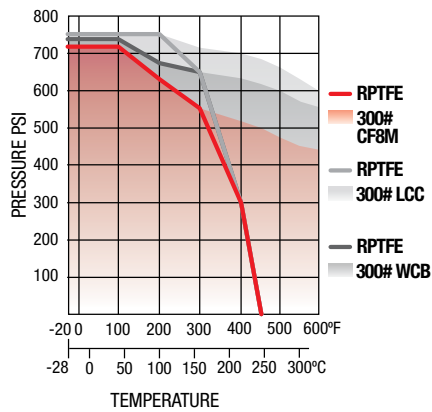
- ASME/ANSI Class 150 B16.34
- NACE MR0175
- Fire-safe to API-607, latest Ed.

### Dimensions

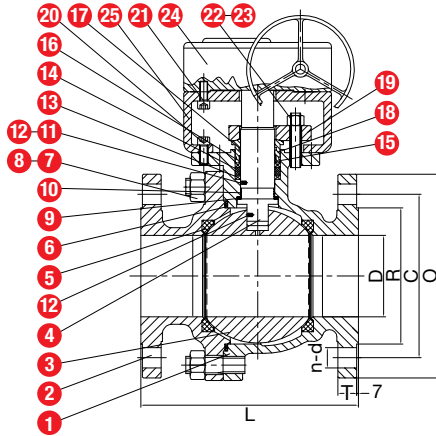
| Size |      | L                  | D                 | R                     | C                     | O                  | n-d                       | T                   | W                  | H                  | WT               | Torque               |                      | CV     |
|------|------|--------------------|-------------------|-----------------------|-----------------------|--------------------|---------------------------|---------------------|--------------------|--------------------|------------------|----------------------|----------------------|--------|
| DIN  | ANSI |                    |                   |                       |                       |                    |                           |                     |                    |                    |                  | 150 PSI              | 285 PSI              |        |
| 50   | 2 in | 8.5 in<br>216 mm   | 1.97 in<br>50 mm  | 3.625 in<br>92.1 mm   | 5 in<br>127 mm        | 6.5 in<br>165 mm   | 8-0.75 in<br>8-19 mm      | 0.814 in<br>20.7 mm | 9.53 in<br>242 mm  | 6.34 in<br>161 mm  | 35 lb<br>16 kg   | 664 lbs<br>75 Nm     | 974 lbs<br>100 Nm    | 450    |
| 80   | 3 in | 11.1 in<br>283 mm  | 2.95 in<br>75 mm  | 5 in<br>127 mm        | 6.62 in<br>168.3 mm   | 8.26 in<br>210 mm  | 8-0.885 in<br>8-22.5 mm   | 1.06 in<br>27 mm    | 13.78 in<br>350 mm | 8.07 in<br>205 mm  | 79 lb<br>36 kg   | 1416 lbs<br>160 Nm   | 2478 lbs<br>280 Nm   | 1100   |
| 100  | 4 in | 12 in<br>305 mm    | 3.98 in<br>101 mm | 6.19 in<br>157.2 mm   | 7.87 in<br>200 mm     | 10.04 in<br>255 mm | 8-0.885 in<br>8-22.5 mm   | 1.19 in<br>30.2 mm  | 18.11 in<br>460 mm | 8.86 in<br>225 mm  | 132 lb<br>60 kg  | 2301 lbs<br>260 Nm   | 3540 lbs<br>400 Nm   | 2200   |
| 150  | 6 in | 15.87 in<br>403 mm | 5.94 in<br>151 mm | 8.5 in<br>215.9 mm    | 10.625 in<br>269.9 mm | 12.6 in<br>320 mm  | 12-0.885 in<br>12-22.5 mm | 1.38 in<br>35 mm    | 29.53 in<br>750 mm | 12.48 in<br>317 mm | 260 lb<br>118 kg | 4426 lbs<br>500 Nm   | 8496 lbs<br>960 Nm   | 5200   |
| 200  | 8 in | 19.76 in<br>502 mm | 7.95 in<br>202 mm | 10.625 in<br>269.9 mm | 13 in<br>330.2 mm     | 14.96 in<br>380 mm | 12-1 in<br>12-25.5        | 1.56 in<br>39.7     | -                  | -                  | 520 lb<br>236 kg | 12611 lbs<br>1425 Nm | 13718 lbs<br>1550 Nm | 10,000 |

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## ZF3



Gear (available on 8")



Gear Operated Material Specification

| #  | Part                    | Carbon Steel (WCB) Material | Low-Temp CS (LCC) Material | Stainless Steel (316SS) Material |
|----|-------------------------|-----------------------------|----------------------------|----------------------------------|
| 1  | Body                    | A216 WCB                    | A352 LCC                   | A351 CF8M                        |
| 2  | End                     | A216 WCB                    | A352 LCC                   | A351 CF8M                        |
| 3  | Ball                    | A182 F316                   | A182 F316                  | A182 F316                        |
| 4  | Stem                    | A182 F316                   | A182 F316                  | A182 F316                        |
| 5  | Seat                    | R-PTFE                      | R-PTFE                     | R-PTFE                           |
| 6  | Body Gasket             | 304 Graphite Spiral Wound   | 304 Graphite Spiral Wound  | 304 Graphite Spiral Wound        |
| 7  | Nut                     | A194-2HM                    | A194-2HM                   | A194-8M                          |
| 8  | Full-threaded Bolt      | A193-B7M                    | A320 L7M                   | A320 B8M                         |
| 9  | Stem Gasket             | PTFE                        | PTFE                       | PTFE                             |
| 10 | Stem Bearing            | PTFE                        | PTFE                       | PTFE                             |
| 11 | Stem Ball               | A276 304                    | A276 304                   | A276 304                         |
| 12 | Anti-static Spring      | A276 304                    | A276 304                   | A276 304                         |
| 13 | Stem Firesafe Gasket I  | Flexible Graphite + 316     | Flexible Graphite + 316    | Flexible Graphite + 316          |
| 14 | Stem Firesafe Gasket II | Flexible Graphite           | Flexible Graphite          | Flexible Graphite                |
| 15 | Packing Gland Bearing   | PTFE                        | PTFE                       | PTFE                             |
| 16 | O-Ring                  | Viton                       | Viton                      | Viton                            |
| 17 | O-Ring                  | Viton                       | Viton                      | Viton                            |
| 18 | Packing Bushing         | A276 316                    | A276 316                   | A276 316                         |
| 19 | Packing Plate           | A216 WCB                    | A352 LCC                   | A216 WCB + Zn                    |
| 20 | Inner Hex Screw         | A193-B7M                    | A320-L7M                   | A320 L8M                         |
| 21 | Inner Hex Screw         | A193-B7M                    | A320-L7M                   | A320 L8M                         |
| 22 | Nut                     | A193-B7M                    | A194-B7                    | A194-8M                          |
| 23 | Bolt                    | A193-B7M                    | A320-L7M                   | A320 B8M                         |
| 24 | Actuator                | Component                   | Component                  | Component                        |
| 25 | Yokes                   | A36                         | A36                        | A36                              |

## Description

Suitable for a full range of water, gas, steam, petrochemical and general use/utility services and applications.

## Working Pressure

- Class 300

## End Connection

- Flanged

## Standard

- ASME/ANSI Class 150 B16.34
- NACE MR0175
- Fire-safe to API-607, latest Ed.

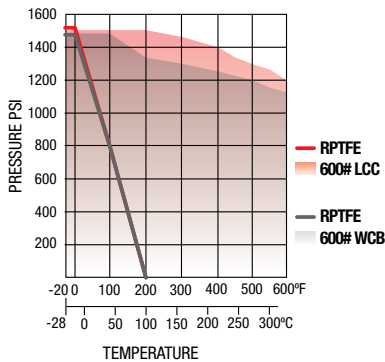
## Dimensions

| Size |      | L                  | D                 | R                     | C                     | O                  | n-d                       | T                   | W                  | H                  | WT               | Torque               |                      | CV     |
|------|------|--------------------|-------------------|-----------------------|-----------------------|--------------------|---------------------------|---------------------|--------------------|--------------------|------------------|----------------------|----------------------|--------|
| DIN  | ANSI |                    |                   |                       |                       |                    |                           |                     |                    |                    |                  | 150 PSI              | 285 PSI              |        |
| 50   | 2 in | 8.5 in<br>216 mm   | 1.97 in<br>50 mm  | 3.625 in<br>92.1 mm   | 5 in<br>127 mm        | 6.5 in<br>165 mm   | 8-0.75 in<br>8-19 mm      | 0.814 in<br>20.7 mm | 9.53 in<br>242 mm  | 6.34 in<br>161 mm  | 35 lb<br>16 kg   | 664 lbs<br>75 Nm     | 974 lbs<br>100 Nm    | 450    |
| 80   | 3 in | 11.1 in<br>283 mm  | 2.95 in<br>75 mm  | 5 in<br>127 mm        | 6.62 in<br>168.3 mm   | 8.26 in<br>210 mm  | 8-0.885 in<br>8-22.5 mm   | 1.06 in<br>27 mm    | 13.78 in<br>350 mm | 8.07 in<br>205 mm  | 79 lb<br>36 kg   | 1416 lbs<br>160 Nm   | 2478 lbs<br>280 Nm   | 1100   |
| 100  | 4 in | 12 in<br>305 mm    | 3.98 in<br>101 mm | 6.19 in<br>157.2 mm   | 7.87 in<br>200 mm     | 10.04 in<br>255 mm | 8-0.885 in<br>8-22.5 mm   | 1.19 in<br>30.2 mm  | 18.11 in<br>460 mm | 8.86 in<br>225 mm  | 132 lb<br>60 kg  | 2301 lbs<br>260 Nm   | 3540 lbs<br>400 Nm   | 2200   |
| 150  | 6 in | 15.87 in<br>403 mm | 5.94 in<br>151 mm | 8.5 in<br>215.9 mm    | 10.625 in<br>269.9 mm | 12.6 in<br>320 mm  | 12-0.885 in<br>12-22.5 mm | 1.38 in<br>35 mm    | 29.53 in<br>750 mm | 12.48 in<br>317 mm | 260 lb<br>118 kg | 4426 lbs<br>500 Nm   | 8496 lbs<br>960 Nm   | 5200   |
| 200  | 8 in | 19.76 in<br>502 mm | 7.95 in<br>202 mm | 10.625 in<br>269.9 mm | 13 in<br>330.2 mm     | 14.96 in<br>380 mm | 12-1 in<br>12-25.5 mm     | 1.56 in<br>39.7 mm  | -                  | -                  | 520 lb<br>236 kg | 12611 lbs<br>1425 Nm | 13718 lbs<br>1550 Nm | 10,000 |

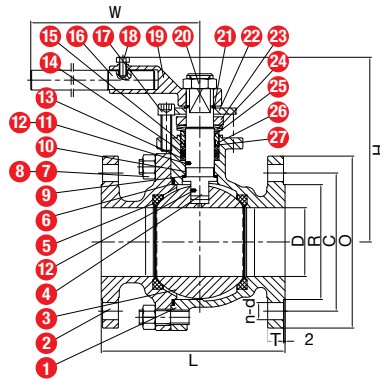
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### Pressure To Temperature Rating



### Lever



### Lever Operated Material Specification

| #  | Part                    | Carbon Steel (WCB) Material | Low-Temp CS (LCC) Material |
|----|-------------------------|-----------------------------|----------------------------|
| 1  | Body                    | A352 LCC                    | A352 LCC                   |
| 2  | End                     | A352 LCC                    | A352 LCC                   |
| 3  | Ball                    | A182 F316                   | A182 F316                  |
| 4  | Stem                    | A182 F316                   | A182 F316                  |
| 5  | Seat                    | Nylon                       | R-PTFE                     |
| 6  | Body Gasket             | 304 Graphite Spiral Wound   | 304 Graphite Spiral Wound  |
| 7  | Nut                     | A194-2HM                    | A194-2HM                   |
| 8  | Full-threaded Bolt      | A320 L7M                    | A320 L7M                   |
| 9  | Stem Gasket             | PTFE                        | PTFE                       |
| 10 | Stem Bearing            | PTFE                        | PTFE                       |
| 11 | Stem Ball               | A276 304                    | A276 304                   |
| 12 | Anti-static Spring      | A276 304                    | A276 304                   |
| 13 | Stem Firesafe Gasket I  | Flexible Graphite + 316     | Flexible Graphite + 316    |
| 14 | Stem Firesafe Gasket II | Flexible Graphite           | Flexible Graphite          |
| 15 | Packing Bushing Bearing | PTFE                        | PTFE                       |
| 16 | Lever                   | AISI 1020                   | AISI 1020                  |
| 17 | Screw                   | A320 L7M                    | A320 L7M                   |
| 18 | Hex Bolt                | CS                          | SS                         |
| 19 | Joint                   | A216 LCC                    | A352 LCC                   |
| 20 | Nut                     | SS                          | AISI 1020                  |
| 21 | Axial Retaining Ring    | AISI 1566                   | AISI 1566                  |
| 22 | Limit Block             | A36                         | A36                        |
| 23 | Nut                     | AISI 1020                   | AISI 1020                  |
| 24 | Belleville Washer       | A276 304                    | A276 304                   |
| 25 | O-Ring                  | Viton                       | Viton                      |
| 26 | O-Ring                  | Viton                       | Viton                      |
| 27 | Packing Bushing         | A276 316                    | A276 316                   |

### Description

Suitable for a full range of water, gas, steam, petrochemical and general use/utility services and applications.

### Working Pressure

- Class 600

### End Connection

- Flanged

### Standard

- ASME/ANSI Class 150 B16.34
- NACE MR0175
- Fire-safe to API-607, latest Ed.

### Dimensions

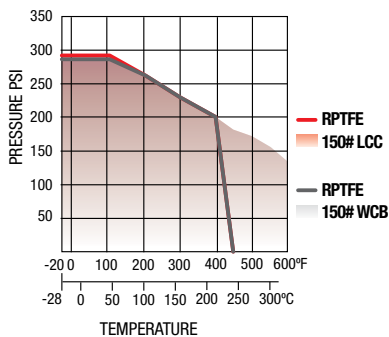
| Size |      | L                 | D                 | R                   | C                   | O                  | n-d                     | T                   | W                  | H                 | WT              | Torque             |                    | CV   |
|------|------|-------------------|-------------------|---------------------|---------------------|--------------------|-------------------------|---------------------|--------------------|-------------------|-----------------|--------------------|--------------------|------|
| DIN  | ANSI |                   |                   |                     |                     |                    |                         |                     |                    |                   |                 | 600 PSI            | 1440 PSI           |      |
| 50   | 2 in | 8.5 in<br>216 mm  | 1.97 in<br>50 mm  | 3.625 in<br>92.1 mm | 5 in<br>127 mm      | 6.5 in<br>165 mm   | 8-0.75 in<br>8-19 mm    | 0.814 in<br>20.7 mm | 9.53 in<br>242 mm  | 6.34 in<br>161 mm | 35 lb<br>16 kg  | 664 lbs<br>75 Nm   | 974 lbs<br>100 Nm  | 450  |
| 80   | 3 in | 11.1 in<br>283 mm | 2.95 in<br>75 mm  | 5 in<br>127 mm      | 6.62 in<br>168.3 mm | 8.26 in<br>210 mm  | 8-0.885 in<br>8-22.5 mm | 1.06 in<br>27 mm    | 13.78 in<br>350 mm | 8.07 in<br>205 mm | 79 lb<br>36 kg  | 1416 lbs<br>160 Nm | 2478 lbs<br>280 Nm | 1100 |
| 100  | 4 in | 12 in<br>305 mm   | 3.98 in<br>101 mm | 6.19 in<br>157.2 mm | 7.87 in<br>200 mm   | 10.04 in<br>255 mm | 8-0.885 in<br>8-22.5 mm | 1.19 in<br>30.2 mm  | 18.11 in<br>460 mm | 8.86 in<br>225 mm | 132 lb<br>60 kg | 2301 lbs<br>260 Nm | 3540 lbs<br>400 Nm | 2200 |

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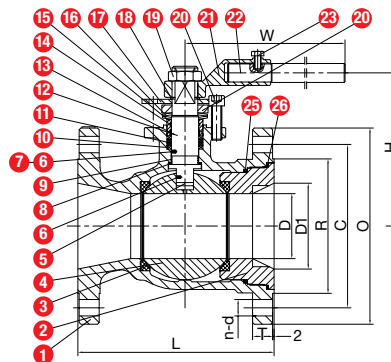
# ZR1



## Pressure To Temperature Rating



## Lever



## Lever Operated Material Specification

| #  | Part                    | Carbon Steel (WCB) Material | Low-Temp CS (LCC) Material |
|----|-------------------------|-----------------------------|----------------------------|
| 1  | Body                    | A216 WCB                    | A352 LCC                   |
| 2  | End                     | A216 WCB                    | A352 LCC                   |
| 3  | Seat                    | R-PFTE                      | R-PFTE                     |
| 4  | Ball                    | A182 F316                   | A182 F316                  |
| 5  | Stem                    | A182 F316                   | A182 F316                  |
| 6  | Stem Steel Ball         | A276 304                    | A276 304                   |
| 7  | Spring                  | A276 304                    | A276 304                   |
| 8  | Stem Gasket             | PTFE                        | PTFE                       |
| 9  | Stem Bearing            | PTFE                        | PTFE                       |
| 10 | Stem Firesafe Gasket I  | Flexible Graphite + 316     | Flexible Graphite + 316    |
| 11 | Stem Firesafe Gasket II | Flexible Graphite           | Flexible Graphite          |
| 12 | Packing Bushing Bearing | PTFE                        | PTFE                       |
| 13 | O-Ring                  | Viton                       | Viton                      |
| 14 | O-Ring                  | Viton                       | Viton                      |
| 15 | Packing Bushing         | A276 316                    | A276 316                   |
| 16 | Belleville Washer       | A276 304                    | A276 304                   |
| 17 | Limit Block             | A36                         | A36                        |
| 18 | Axial Retaining Ring    | AISI 1566                   | AISI 1566                  |
| 19 | Nut                     | SS                          | SS                         |
| 20 | Screw                   | A193 B7M                    | AZ320 L7M                  |
| 21 | Joint                   | A216 WCB                    | A216 LCC                   |
| 22 | Lever                   | AISI 1020                   | AISI 1020                  |
| 23 | Hex Bolt                | CS                          | CS                         |
| 24 | Nut                     | SS                          | SS                         |
| 25 | Gasket                  | PTFE                        | PTFE                       |
| 26 | Gasket                  | Flexible Graphite + 316     | Flexible Graphite + 316    |

## Description

Suitable for a full range of water, gas, steam, petrochemical and general use/utility services and applications.

## Working Pressure

- Class 150

## End Connection

- Flanged

## Standard

- ASME/ANSI Class 150 B16.34
- NACE MR0175
- Fire-safe to API-607, latest Ed.

## Dimensions

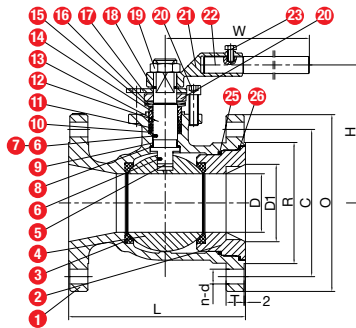
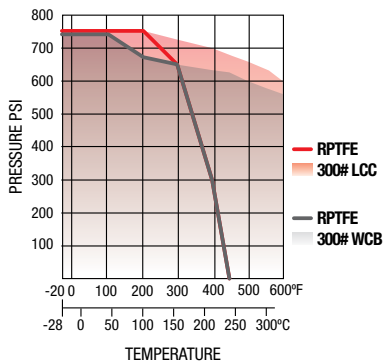
| Size |      | L                 | D                 | D1                | R                     | C                    | O                  | n-d                     | T                   | W                  | H                  | WT               | Torque               |                      | CV   |
|------|------|-------------------|-------------------|-------------------|-----------------------|----------------------|--------------------|-------------------------|---------------------|--------------------|--------------------|------------------|----------------------|----------------------|------|
| DIN  | ANSI |                   |                   |                   |                       |                      |                    |                         |                     |                    |                    |                  | 150 PSI              | 285 PSI              |      |
| 50   | 2 in | 7 in<br>178 mm    | 1.46 in<br>37 mm  | 1.97 in<br>50 mm  | 3.625 in<br>92.1 mm   | 4.75 in<br>120.7 mm  | 5.9 in<br>150 mm   | 4-0.75 in<br>4-19 mm    | 0.562 in<br>14.3 mm | 9.53 in<br>14.3 mm | 5.4 in<br>137 mm   | 22 lb<br>9.7 kg  | 221 in lb<br>25 Nm   | 487 in lb<br>55 Nm   | 130  |
| 80   | 3 in | 8 in<br>203 mm    | 1.97 in<br>50 mm  | 2.95 in<br>75 mm  | 5 in<br>127 mm        | 6 in<br>152.4 mm     | 7.48 in<br>190 mm  | 4-0.75 in<br>4-19 mm    | 0.69 in<br>17.5 mm  | 9.35 in<br>242 mm  | 6.575 in<br>167 mm | 40 lb<br>18 kg   | 372 in lb<br>42 Nm   | 620 in lb<br>70 Nm   | 350  |
| 100  | 4 in | 9.02 in<br>229 mm | 2.95 in<br>75 mm  | 3.98 in<br>101 mm | 6.19 in<br>157.2 mm   | 7.5 in<br>190.5 mm   | 9.05 in<br>230 mm  | 4-0.75 in<br>8-19 mm    | 0.88 in<br>22.3 mm  | 13.78 in<br>350 mm | 8.07 in<br>205 mm  | 77 lb<br>35 kg   | 797 in lb<br>90 Nm   | 1328 in lb<br>150 Nm | 720  |
| 150  | 6 in | 10.5 in<br>267 mm | 3.98 in<br>101 mm | 5.94 in<br>151 mm | 8.5 in<br>215.9 mm    | 9.5 in<br>241.3 mm   | 11.02 in<br>280 mm | 4-0.885 in<br>8-22.5 mm | 0.94 in<br>23.9 mm  | 18.11 in<br>460 mm | 8.66 in<br>220 mm  | 132 lb<br>60 kg  | 1328 in lb<br>150 Nm | 2168 in lb<br>245 Nm | 1020 |
| 200  | 8 in | 11.5 in<br>292 mm | 5.94 in<br>151 mm | 7.95 in<br>202 mm | 10.625 in<br>269.9 mm | 11.75 in<br>298.5 mm | 13.58 in<br>345 mm | 4-0.885 in<br>8-22.5 mm | 1.06 in<br>27 mm    | 29.52 in<br>750 mm | 12.32 in<br>313 mm | 265 lb<br>120 kg | 3009 in lb<br>340 Nm | 4956 in lb<br>560 Nm | 1800 |

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Lever

## Pressure To Temperature Rating



## Lever Operated Material Specification

| #  | Part                    | Carbon Steel (WCB) Material | Low-Temp CS (LCC) Material |
|----|-------------------------|-----------------------------|----------------------------|
| 1  | Body                    | A216 WCB                    | A352 LCC                   |
| 2  | End                     | A216 WCB                    | A352 LCC                   |
| 3  | Seat                    | R-PFTE                      | R-PFTE                     |
| 4  | Ball                    | A182 F316                   | A182 F316                  |
| 5  | Stem                    | A182 F316                   | A182 F316                  |
| 6  | Stem Steel Ball         | A276 304                    | A276 304                   |
| 7  | Spring                  | A276 304                    | A276 304                   |
| 8  | Stem Gasket             | PTFE                        | PTFE                       |
| 9  | Stem Bearing            | PTFE                        | PTFE                       |
| 10 | Stem Firesafe Gasket I  | Flexible Graphite + 316     | Flexible Graphite + 316    |
| 11 | Stem Firesafe Gasket II | Flexible Graphite           | Flexible Graphite          |
| 12 | Packing Bushing Bearing | PTFE                        | PTFE                       |
| 13 | O-Ring                  | Viton                       | Viton                      |
| 14 | O-Ring                  | Viton                       | Viton                      |
| 15 | Packing Bushing         | A276 316                    | A276 316                   |
| 16 | Belleville Washer       | A276 316                    | A276 316                   |
| 17 | Limit Block             | A36                         | A36                        |
| 18 | Axial Retaining Ring    | AISI 1566                   | AISI 1566                  |
| 19 | Nut                     | SS                          | SS                         |
| 20 | Screw                   | A193 B7M                    | AZ320 L7M                  |
| 21 | Joint                   | A216 WCB                    | A216 LCC                   |
| 22 | Lever                   | AISI 1020                   | AISI 1020                  |
| 23 | Hex Bolt                | CS                          | CS                         |
| 24 | Nut                     | SS                          | SS                         |
| 25 | Gasket                  | PTFE                        | PTFE                       |
| 26 | Gasket                  | Flexible Graphite + 316     | Flexible Graphite + 316    |

## Description

Suitable for a full range of water, gas, steam, petrochemical and general use/utility services and applications.

## Working Pressure

- Class 300

## End Connection

- Flanged

## Standard

- ASME/ANSI Class 150 B16.34
- NACE MR0175
- Fire-safe to API-607, latest Ed.

## Dimensions

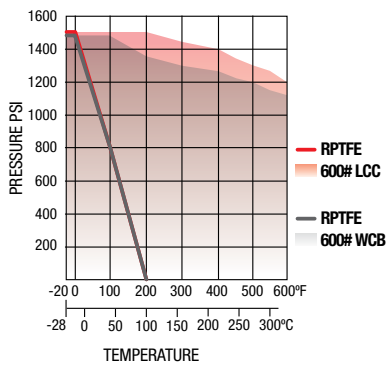
| Size |      | L                  | D                 | D1                | R                   | C                     | O                  | n-d                       | T                   | W                  | H                  | WT                | Torque             |                    | CV   |
|------|------|--------------------|-------------------|-------------------|---------------------|-----------------------|--------------------|---------------------------|---------------------|--------------------|--------------------|-------------------|--------------------|--------------------|------|
| DIN  | ANSI |                    |                   |                   |                     |                       |                    |                           |                     |                    |                    |                   | 300 PSI            | 740 PSI            |      |
| 50   | 2 in | 8.5 in<br>216 mm   | 1.46 in<br>37 mm  | 1.97 in<br>50 mm  | 3.625 in<br>92.1 mm | 5 in<br>127 mm        | 6.5 in<br>165 mm   | 8-0.75 in<br>8-19 mm      | 0.814 in<br>20.7 mm | 9.53 in<br>242 mm  | 5.4 in<br>mm       | 33 lbs<br>15 kg   | 575 lbs<br>65 Nm   | 841 lbs<br>95 Nm   | 130  |
| 80   | 3 in | 11.1 in<br>283 mm  | 1.97 in<br>50 mm  | 2.95 in<br>75 mm  | 5 in<br>127 mm      | 6.62 in<br>168.3 mm   | 8.26 in<br>210 mm  | 8-0.885 in<br>8-22.5 mm   | 1.06 in<br>27 mm    | 9.53 in<br>242 mm  | 6.575 in<br>167 mm | 69 lbs<br>31.2 kg | 664 lbs<br>75 Nm   | 974 lbs<br>110 Nm  | 350  |
| 100  | 4 in | 12 in<br>305 mm    | 2.95 in<br>75 mm  | 3.98 in<br>101 mm | 6.19 in<br>157.2 mm | 7.87 in<br>200 mm     | 10.04 in<br>255 mm | 8-0.885 in<br>8-22.5 mm   | 1.19 in<br>30.2 mm  | 13.78 in<br>350 mm | 8.07 in<br>205 mm  | 126 lbs<br>57 kg  | 1415 lbs<br>160 Nm | 2478 lbs<br>280 Nm | 720  |
| 150  | 6 in | 15.87 in<br>403 mm | 3.98 in<br>101 mm | 5.94 in<br>151 mm | 8.5 in<br>215.9 mm  | 10.625 in<br>269.9 mm | 12.6 in<br>320 mm  | 12-0.885 in<br>12-22.5 mm | 1.38 in<br>35 mm    | 18.11 in<br>460 mm | 8.66 in<br>220 mm  | 183 lbs<br>83 kg  | 2301 lbs<br>260 Nm | 3540 lbs<br>400 Nm | 1020 |

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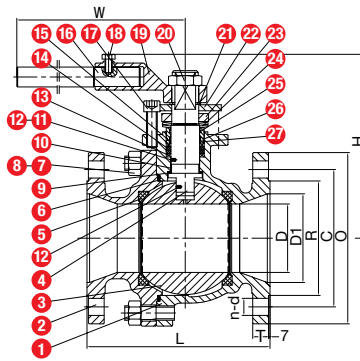
# ZR6



## Pressure To Temperature Rating



## Lever



## Lever Operated Material Specification

| #  | Part                    | Carbon Steel (WCB) Material | Low-Temp CS (LCC) Material |
|----|-------------------------|-----------------------------|----------------------------|
| 1  | Body                    | A216 WCB                    | A352 LCC                   |
| 2  | End                     | A216 WCB                    | A352 LCC                   |
| 3  | Ball                    | A182 F316                   | A182 F316                  |
| 4  | Stem                    | A182 F316                   | A182 F316                  |
| 5  | Seat                    | Nylon                       | Nylon                      |
| 6  | Body Gasket             | 304 Graphite Spiral Wound   | 304 Graphite Spiral Wound  |
| 7  | Nut                     | A194-2HM                    | A194-2HM                   |
| 8  | Full-Threaded Bolt      | A193-B7M                    | A320 L7M                   |
| 9  | Stem Gasket             | PTFE                        | PTFE                       |
| 10 | Stem Bearing            | PTFE                        | PTFE                       |
| 11 | Steel Ball              | A276 304                    | A276 304                   |
| 12 | Anti-Static Spring      | A276 304                    | A276 304                   |
| 13 | Stem Firesafe Gasket I  | Flexible Graphite + 316     | Flexible Graphite + 316    |
| 14 | Stem Firesafe Gasket II | Flexible Graphite           | Flexible Graphite          |
| 15 | Packing Gland Bearing   | PTFE                        | PTFE                       |
| 16 | Lever                   | AISI 1020                   | AISI 1020                  |
| 17 | Screw                   | A193-B7M                    | A320 L7M                   |
| 18 | Hex Bolt                | A193-B7M                    | SS                         |
| 19 | Joint                   | A216 WCB                    | A352 LCC                   |
| 20 | Nut                     | AISI 1020                   | AISI 1020                  |
| 21 | Axial Retaining Ring    | AISI 1566                   | AISI 1566                  |
| 22 | Limit Block             | A36                         | A36                        |
| 23 | Nut                     | AISI 1020                   | AISI 1020                  |
| 24 | Belleville Washer       | A276 304                    | A276 304                   |
| 25 | O-Ring                  | Viton                       | Viton                      |
| 26 | O-Ring                  | Viton                       | Viton                      |
| 27 | Packing Bushing         | A276 316                    | A276 316                   |

## Description

Suitable for a full range of water, gas, steam, petrochemical and general use/utility services and applications.

## Working Pressure

- Class 600

## End Connection

- Flanged

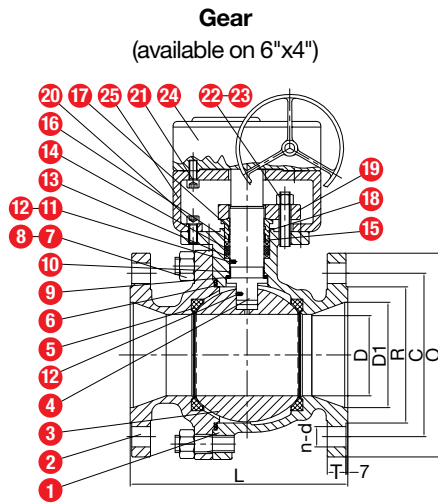
## Standard

- ASME/ANSI Class 150 B16.34
- NACE MR0175
- Fire-safe to API-607, latest Ed.

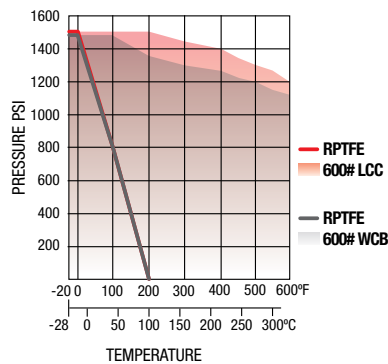
## Dimensions

| Size |      | L                 | D                 | D1                | R                   | C                   | O                  | n-d                      | T                  | W                  | H                 | WT                | Torque             |                    | CV   |
|------|------|-------------------|-------------------|-------------------|---------------------|---------------------|--------------------|--------------------------|--------------------|--------------------|-------------------|-------------------|--------------------|--------------------|------|
| DIN  | ANSI |                   |                   |                   |                     |                     |                    |                          |                    |                    |                   |                   | 300 PSI            | 740 PSI            |      |
| 50   | 2 in | 11.5 in<br>292 mm | 1.46 in<br>37 mm  | 1.97 in<br>50 mm  | 3.625 in<br>92.1 mm | 5 in<br>127 mm      | 6.5 in<br>165 mm   | 8-0.75 in<br>8-19 mm     | 1 in<br>25.4 mm    | 9.53 in<br>242 mm  | 5.4 in<br>137 mm  | 40 lbs<br>18.2 kg | 664 lbs<br>75 Nm   | 1328 lbs<br>150 Nm | 130  |
| 80   | 3 in | 14 in<br>356 mm   | 1.97 in<br>50 mm  | 2.95 in<br>75 mm  | 5 in<br>127 mm      | 6.62 in<br>168.3 mm | 8.26 in<br>210 mm  | 8-0.885 in<br>8-22.5 mm  | 1.25 in<br>31.8 mm | 13.78 in<br>350 mm | 7.56 in<br>192 mm | 77 lbs<br>35 kg   | 841 lbs<br>95 Nm   | 1682 lbs<br>190 Nm | 350  |
| 100  | 4 in | 17 in<br>432 mm   | 2.95 in<br>75 mm  | 3.98 in<br>101 mm | 6.19 in<br>157.2 mm | 8.5 in<br>215.9 mm  | 10.82 in<br>275 mm | 8-1 in<br>8-25.5 mm      | 1.5 in<br>38.1 mm  | 21.65 in<br>550 mm | 8.2 in<br>205 mm  | 165 lbs<br>75 kg  | 2080 lbs<br>235 Nm | 4071 lbs<br>460 Nm | 720  |
| 150  | 6 in | 22 in<br>559 mm   | 3.98 in<br>101 mm | 5.94 in<br>151 mm | 8.5 in<br>215.9 mm  | 11.5 in<br>292.1 mm | 13.98 in<br>355 mm | 12-1.12 in<br>12-28.5 mm | 1.88 in<br>47.7 mm | -<br>-             | -<br>-            | 342 lbs<br>155 kg | 2567 lbs<br>290 Nm | 5089 lbs<br>575 Nm | 1020 |

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### Pressure To Temperature Rating



### Gear Operated Material Specification

| #  | Part                    | Carbon Steel (WCB) Material | Low-Temp CS (LCC) Material |
|----|-------------------------|-----------------------------|----------------------------|
| 1  | Body                    | A216 WCB                    | A352 LCC                   |
| 2  | End                     | A216 WCB                    | A352 LCC                   |
| 3  | Ball                    | A182 F316                   | A182 F316                  |
| 4  | Stem                    | A182 F316                   | A182 F316                  |
| 5  | Seat                    | Nylon                       | Nylon                      |
| 6  | Body Gasket             | 304 Graphite Spiral Wound   | 304 Graphite Spiral Wound  |
| 7  | Nut                     | A194-2HM                    | A194-2HM                   |
| 8  | Full-Threaded Bolt      | A193-B7M                    | A320 L7M                   |
| 9  | Stem Gasket             | PTFE                        | PTFE                       |
| 10 | Stem Bearing            | PTFE                        | PTFE                       |
| 11 | Steel Ball              | A276 304                    | A276 304                   |
| 12 | Anti-Static Spring      | A276 304                    | A276 304                   |
| 13 | Stem Firesafe Gasket I  | Flexible Graphite + 316     | Flexible Graphite + 316    |
| 14 | Stem Firesafe Gasket II | Flexible Graphite           | Flexible Graphite          |
| 15 | Packing Gland Bearing   | PTFE                        | PTFE                       |
| 16 | O-Ring                  | Viton                       | Viton                      |
| 17 | O-Ring                  | Viton                       | Viton                      |
| 18 | Packing Bushing         | A276 316                    | A276 316                   |
| 19 | Packing Plate           | A216 WCB                    | A352 LCC                   |
| 20 | Inner Hex Screw         | A193-B7M                    | A320-L7M                   |
| 21 | Inner Hex Screw         | A193-B7M                    | A320-L7M                   |
| 22 | Nut                     | A193-B7M                    | A194-B7                    |
| 23 | Bolt                    | A193-B7M                    | A320-L7M                   |
| 24 | Actuator                | Component                   | Component                  |
| 25 | Yokes                   | A36                         | A36                        |

### Description

Suitable for a full range of water, gas, steam, petrochemical and general use/utility services and applications.

### Working Pressure

- Class 600

### End Connection

- Flanged

### Standard

- ASME/ANSI Class 150 B16.34
- NACE MR0175
- Fire-safe to API-607, latest Ed.

### Dimensions

| Size |      | L                 | D                 | D1                | R                   | C                   | O                  | n-d                      | T                  | W                  | H                 | WT                | Torque             |                    | CV   |
|------|------|-------------------|-------------------|-------------------|---------------------|---------------------|--------------------|--------------------------|--------------------|--------------------|-------------------|-------------------|--------------------|--------------------|------|
| DIN  | ANSI |                   |                   |                   |                     |                     |                    |                          |                    |                    |                   |                   | 300 PSI            | 740 PSI            |      |
| 50   | 2 in | 11.5 in<br>292 mm | 1.46 in<br>37 mm  | 1.97 in<br>50 mm  | 3.625 in<br>92.1 mm | 5 in<br>127 mm      | 6.5 in<br>165 mm   | 8-0.75 in<br>8-19 mm     | 1 in<br>25.4 mm    | 9.53 in<br>242 mm  | 5.4 in<br>137 mm  | 40 lbs<br>18.2 kg | 664 lbs<br>75 Nm   | 1328 lbs<br>150 Nm | 130  |
| 80   | 3 in | 14 in<br>356 mm   | 1.97 in<br>50 mm  | 2.95 in<br>75 mm  | 5 in<br>127 mm      | 6.62 in<br>168.3 mm | 8.26 in<br>210 mm  | 8-0.885 in<br>8-22.5 mm  | 1.25 in<br>31.8 mm | 13.78 in<br>350 mm | 7.56 in<br>192 mm | 77 lbs<br>35 kg   | 841 lbs<br>95 Nm   | 1682 lbs<br>190 Nm | 350  |
| 100  | 4 in | 17 in<br>432 mm   | 2.95 in<br>75 mm  | 3.98 in<br>101 mm | 6.19 in<br>157.2 mm | 8.5 in<br>215.9 mm  | 10.82 in<br>275 mm | 8-1 in<br>8-25.5 mm      | 1.5 in<br>38.1 mm  | 21.65 in<br>550 mm | 8.2 in<br>205 mm  | 165 lbs<br>75 kg  | 2080 lbs<br>235 Nm | 4071 lbs<br>460 Nm | 720  |
| 150  | 6 in | 22 in<br>559 mm   | 3.98 in<br>101 mm | 5.94 in<br>151 mm | 8.5 in<br>215.9 mm  | 11.5 in<br>292.1 mm | 13.98 in<br>355 mm | 12-1.12 in<br>12-28.5 mm | 1.88 in<br>47.7 mm | -                  | -                 | 342 lbs<br>155 kg | 2567 lbs<br>290 Nm | 5089 lbs<br>575 Nm | 1020 |

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# Calculating Torque

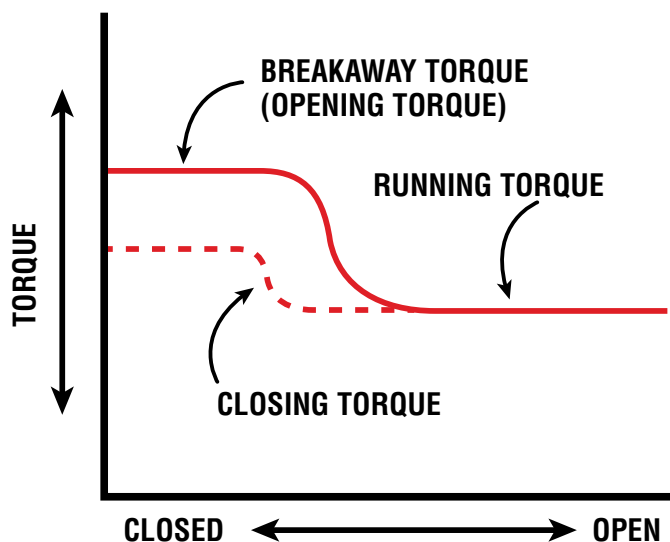
## Valve Torque

The amount of torque required by the valve must be determined before the actuator can be sized for any type of valve application. There are a number of factors that influence the operating torque of the ball valves; relating to design, material or application and service condition.

The torque required to operate a ball valve derives from two separate areas within the valve - both cases resulting from friction between metal and relatively soft sealing materials.

## Stem Torque

Stem torque is primarily dependent upon the tightness of the stem nut. An important part of the valve performance and life is proper adjustment of the stem nut. If the nut is too loose, there will be leakage from the valve; if the nut is too tight, the total torque requirement can be increased to the point where the actuator may not have enough power to cycle the valve.



## Ball/Seat Torque

Friction between the ball and the seat creates Ball/Seat torque and is very sensitive to service conditions. The higher the system pressure, the higher the torque.

Valve torque is also a function of the media flowing through the valves. Abrasive media tends to increase the amount of friction between the ball and seats, whereas some light oils (which provide additional lubricity) can reduce the amount of torque required.

The torque necessary to operate a ball valve is maximum at the beginning of opening, due to the change in the ball surface in contact with seats.

| Application Factor                                 | Multiplier |
|----------------------------------------------------|------------|
| <b>A. Service</b>                                  |            |
| On-off                                             | 1.0        |
| Emergency shutdown cycled less than once per month | 2.0        |
| Throttling control w/ positioner                   | 1.2        |
| Applications with less than 2 cycles/day           | 1.2        |
| Applications below -20°F                           | 1.25       |
| Clean Dry Assy (V38)                               | 2.0        |
| Cavity Filler Seats                                | 1.3        |
| <b>B. Media</b>                                    |            |
| Saturated steam                                    | 1.2        |
| Liquid, clean (particle free)                      | 1.0        |
| Liquid, dirty (slurry), raw water                  | 1.8        |
| Gas, clean and wet                                 | 1.2        |
| Gas, clean and dry                                 | 1.0        |
| Gas, dirty (natural gas)                           | 1.5        |
| Chlorine                                           | 1.5        |





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## Elite Valve



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